



SMX System

MultiMatrix Switcher



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL



Safety Instructions • English

-  This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.
-  This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

- Read Instructions** • Read and understand all safety and operating instructions before using the equipment.
- Retain Instructions** • The safety instructions should be kept for future reference.
- Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.
- Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.



Consignes de Sécurité • Français

-  Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).
-  Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

- Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.
- Conservser les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.
- Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.
- Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.



Sicherheitsanleitungen • Deutsch

-  Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.
-  Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

- Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.
- Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.
- Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.
- Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.



Instrucciones de seguridad • Español

-  Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.
-  Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

- Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.
- Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.
- Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.
- Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

安全须知 • 中文

-  这个符号提示用户该设备用户手册中有重要的操作和维护说明。
-  这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

- 阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。
- 保存说明书** • 用户应保存安全说明书以备将来使用。
- 遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。
- 避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

Warning

- Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.
- Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).
- Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.
- Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.
- Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.
- Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

- Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.
- Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.
- Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.
- Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.
- Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.
- Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

- Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.
- Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.
- Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.
- Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.
- Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.
- Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

- Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminaria.
- Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.
- Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.
- Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.
- Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.
- Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

警告

- 电源** • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。
- 拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。
- 电源线保护** • 妥善布线，避免被踩踏，或重物挤压。
- 维护** • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。
- 通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要有任何东西挡住通风孔。
- 锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, [click here](#).

Conventions Used in this Guide

In this user guide, the following are used:

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

CAUTION: A caution indicates a potential hazard to equipment or data.

WARNINGS: A warning warns of things or actions that might cause injury, death, or other severe consequences.

Commands are written in the fonts shown here:

```
^ARMerge Scene,,Op1 scene 1,1 ^B 51 ^W ^C
```

```
[01] R000400300004000080000600 [02] 35 [17] [03]
```

```
Esc[X1]*[X17]*[X20]*[X23]*[X21]CE ←
```

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character “0” is used for the number zero and “O” represents the capital letter “o.”

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 208.132.180.48: bytes=32 times=2ms TTL=32
```

```
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx -t
```

```
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

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Introduction

This guide contains installation, configuration, and operating information for the Extron SMX MultiMatrix Switcher with optional input/output (I/O) boards. It covers operations using the front panel controls and Simple Instruction Set (SIS™) commands. It also describes how to load and start up the SMX Control Program that runs on Windows® operating systems and how to connect to the built-in HTML pages, for additional methods of operating the SMX.

In this manual the following terms are used:

“SMX switcher,” “SMX,” and “switcher,” are used interchangeably to refer to a typical SMX System MultiMatrix Switcher. “Video model” refers to any SMX switcher that switches only video. “Audio model” refers to any SMX switcher that switches only audio.

This section contains general information about the SMX switcher and includes:

- **SMX Series Description**
- **Definitions**
- **Features**

SMX Series Description

The SMX is a modular, configurable, multi-format card cage system, available in 2U (SMX 200), 3U (SMX 300), 4U (SMX 400), or 5U (SMX 500) frames. Each frame has rear panel slots into which I/O boards can be inserted in any configuration and signal type.

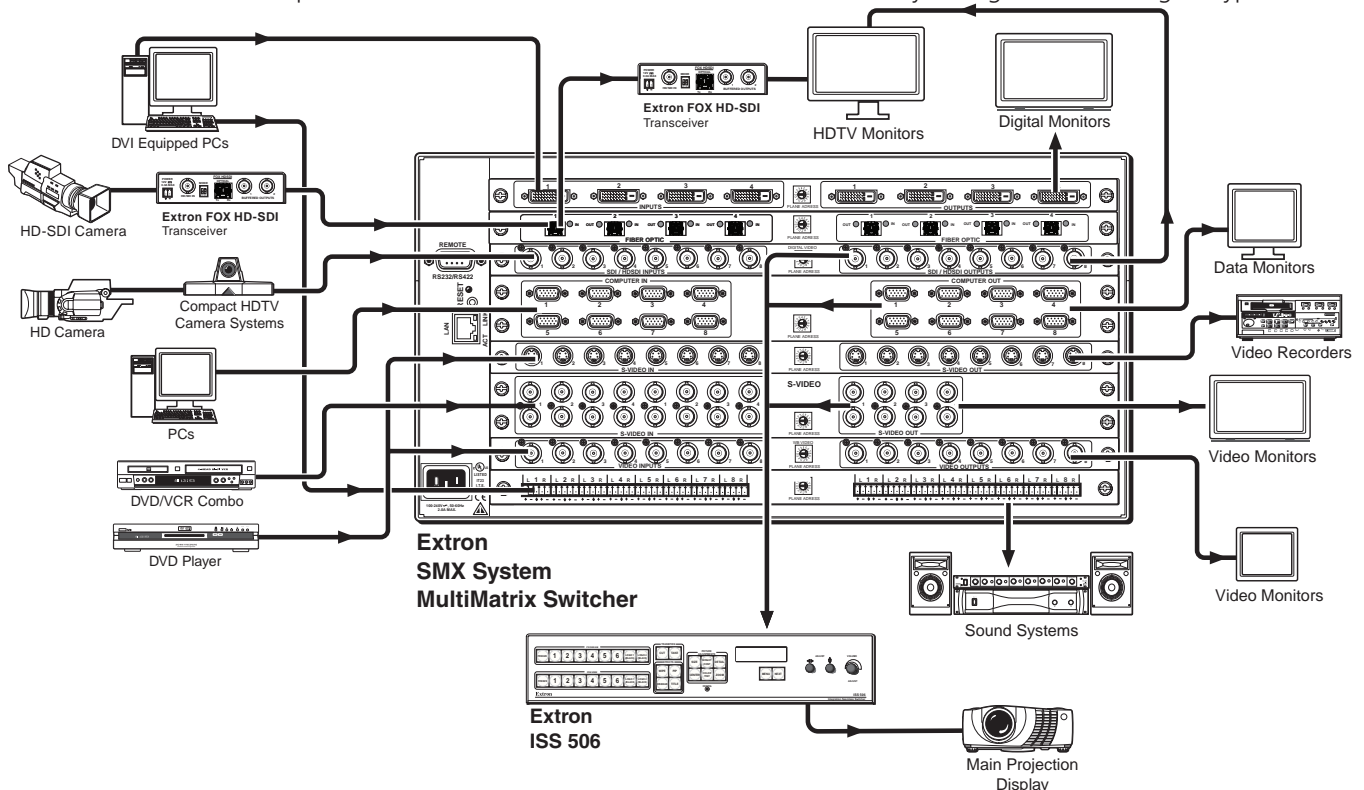











Figure 1. Typical Matrix Switcher Application (5U Unit)

The table below gives a list of available I/O (Input/Output) boards, the number and type of connectors, and the number of slots used by any given board. For example, from the first row, the SMX 84 V is an 8x4 (8 inputs by 4 outputs) composite video board. It takes up one slot, and has BNC connectors.

Board Type	I/O Connector		Board Names Board Sizes (Slots Used)				
Composite Video	BNC				SMX 84 V 8x4 (1)	SMX 88 V 8x8 (1)	SMX 1616 V 16x16 (2)
S-video	BNC				SMX 84 YC 8x4 (2)	SMX 88 YC 8x8 (2)	SMX 1616 YC 16x16 (4)
SDI and HD-SDI	BNC		SMX 44 HD-SDI 4x4 (1)		SMX 84 HD-SDI 8x4 (1)	SMX 88 HD-SDI 8x8 (1)	SMX 1616 HD-SDI 16x16 (2)
Ultra Wideband	BNC				SMX 84 WB 8x4 (1)	SMX 88 WB 8x8 (1)	SMX 1616 WB 16x16 (2)
Sync	BNC					SMX 88 SYNC (H or V) 8x8 (1) SMX 88 H+V 8x8 (2)	SMX 1616 SYNC (H or V) 16x16 (2)
Stereo Audio	Captive screw				SMX 84 A 8x4 (1)	SMX 88 A 8x8 (1)	SMX 1616 A 16x16 (2)
DVI	DVI-I (digital)		SMX 44 DVI 4x4 (1)	SMX 48 DVI 4x8 (2)	SMX 84 DVI 8x4 (2)	SMX 88 DVI 8x8 (2)	
DVI-Pro			SMX 44 DVI Pro 4x4 (1)	SMX 48 DVI Pro 4x8 (2)	SMX 84 DVI Pro 8x4 (2)	SMX 88 DVI Pro 8x8 (2)	
S-video boards	mini DIN				SMX 84 SV 8x4 (1)	SMX 88 SV 8x8 (1)	SMX 1616 SV 16x16 (2)
HDMI	HDMI		SMX 44 HDMI 4x4 (1)	SMX 48 HDMI 4x8 (2)	SMX 84 HDMI 8x4 (2)	SMX 88 HDMI 8x8 (2)	
Wideband VGA	15-pin HD				SMX 84 VGA 8x4 (2)	SMX 88 VGA 8x8 (2)	SMX 1616 VGA 16x16 (4)
Fiber optic (singlemode)	Optical (SFP)					SMX 88 FOX 4G SM 8x8 (1)	SMX 1616 4G SM 16x16 (2)
Fiber optic (multimode)						SMX 88 FOX 4G MM 8x8 (1)	SMX 1616 4G MM 16x16 (2)
USB	USB B input		SMX 44 USB 4x4 (1)		SMX 84 USB 8x4 (1)		
	USB A output						

The 2U frame has 4 single board slots, the 3U frame has 6 single board slots, the 4U frame has 8 slots, and the 5U frame has 10 slots. Each slot supports power and control connections to the I/O boards. When a board is installed into a slot it may use more than one slot. For example, the SMX 1616 VGA board uses four slots. The slots that a board covers are not available for other I/O board installation until that multi-slot board has been removed (see [Installing the I/O Boards](#) on page 10 for details).

NOTE: To customize the SMX unit, use the SMX Configurator program, available at www.extron.com, or contact Extron Customer Support (see [rear outer cover](#) for contact numbers).

Definitions

The following terms are used throughout this guide:

Tie — An input-to-output connection

Set of ties — An input *tied* to two or more outputs. An output can never be tied to more than one input

Configuration — One or more *ties* or one or more *sets of ties*

Current configuration — The *configuration* that is currently active in the switcher (also called *configuration 0*)

Plane — A board or set of boards that will be switched together. Plane numbers are set by a rotary switch on each board.

Global memory preset — An *I/O configuration* that has been stored (all planes). Up to 32 *global memory presets* can be stored. Preset locations are assigned to the input buttons and output buttons and can be selected from the front panel, serial port, or Ethernet control for either saving or retrieving. When a *preset* is recalled from memory, it becomes the *current configuration*.

Plane memory preset — A *plane configuration* that has been stored. Up to 10 *plane presets* per switching plane can be saved and recalled without affecting the other I/O plane connections.

EDID — Extended Display Identification Data. A communications protocol or instruction set developed by VESA (Video Electronics Standards Association) for the identification of display devices to computers using the DDC (Display Data Channel) transmission standard

HDCP — High-bandwidth Digital Content Protection. An encryption method developed by Intel that protects copyrighted digital entertainment material that uses the Digital Video Interface (DVI) and High Definition Multimedia Interface (HDMI)

DVI — Digital Visual Interface. The digital video connectivity standard developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video. DVI standard uses TDMS (Transition Minimized Differential Signal) from Silicon Image and DDC (Display Data Channel) from VESA (Video Electronics Standards Association). DVI-D supports digital signal transfer only, and DVI-I supports both digital and analog signal transfer.

HDMI — High Definition Multimedia Interface. A specification developed by the HDMI Working Group that combines video, multi-channel audio, and control signals into a single digital interface for use with DVD players, digital television, and other audiovisual devices

SDI — Serial Digital Interface. This standard is based on a 270 Mbps transfer rate. It is a 10-bit, scrambled, polarity independent interface with common scrambling for both component ITU-R 601 and composite digital video and four channels of embedded digital audio.

HD-SDI — High-definition version of SDI specified in SMPTE-292M. This standard transmits audio and video over a single coaxial cable with a data rate of 1.485 Gbit/second.

USB — Universal Serial Bus. Developed by PC and telecom industry leaders, USB was designed for easy plug-and-play expansion outside the device, requiring no additional circuit cards. USB devices can be attached or detached without removing computer power.

Features

Hot swappable Input/Output boards and SFP modules — Any board or SFP module can be added or replaced without taking the unit out of service or removing the power.

Channel to channel isolation — Each I/O board provides isolation between channels and extremely low electrostatic emissions.

Quick-Switch Front Panel Controller (QS-FPC™) — The QuickSwitch FPC allows for touch-of-a-button input and output selection and switching.

Presets — This time-saving feature allows the setup and recall of recurring I/O configurations using either the front panel, RS-232 or RS-422, or Ethernet.

Global: Up to 32 individual I/O configurations may be saved and recalled.

Plane: Up to 10 presets per switching plane can be saved and recalled without affecting the other I/O plane connections.

RS-232 and RS-422 control — A rear panel RS-232/RS-422 control port provides connection to control software via a control system or PC.

Front panel control configuration port — A front panel 2.5 mm mini jack is available for setup and configuration the SMX without having to access the rear of the unit while it is installed within a rack system.

Simple Instruction Set (SIS) — The remote control protocol uses SIS commands for easy programming and operation.

Control and configuration software — For RS-232, RS-422, and Ethernet control from a PC, the Extron control software that runs on Windows operation systems is supplied with every matrix switcher. This icon-driven software uses a graphical, drag-and-drop interface to make input and output configuration and other customization functions simple and convenient. The software also offers an emulation mode for configuration of an off-site matrix switcher; the input and output configuration can then be saved for future downloading to the SMX.

IP Control (Ethernet) via the LAN port — This port allows the switcher to be controlled through an Ethernet local area network (LAN) or wide area network (WAN) using standard IP internet protocols. This ability provides flexible connectivity for off-site control and password-protection of the switcher.

Web hosting — Users can upload customized web pages into the switcher.

Digital Sync Validation Processing (DSVP™) — In critical environments or unmanned, remote locations, it may be vital to know that sources are active and switching. Extron DSVP confirms that input sources are active by scanning all sync inputs for active signals. DSVP provides instant frequency feedback for composite sync or separate horizontal and vertical sync signals via the RS232/RS422 port or the Ethernet port.

Virtual plane grouping — Switching planes can be grouped together to make a single, virtual switching plane. Plane grouping allows several signal planes to act as a single unit with a single control command affecting all planes

Audio input gain and attenuation — Users can set the input level of audio gain or attenuation (-18 dB to +24 dB) via the RS232/RS422 port, an Ethernet link, or the front panel. Individual input audio levels can be adjusted so there are no noticeable volume differences between sources.

Audio output volume (audio I/O boards) — The audio volume of each output can be displayed and adjusted through a range from full output to completely silent using the front panel, or through serial port or Ethernet control.

RGB Delay (VGA and RGBHV) — This allows the delay of the output of the signal by a specified time (the delay time), enabling video and audio signals to be kept in sync. RGB Delay can be set via the front panel, RS-232 or RS-422, or LAN connection.

Three front panel security lockout modes (executive modes) — If a matrix switcher is installed in an area where operation by unauthorized personnel may be a problem, either of two security lockout modes can be implemented (the third mode is unlocked). When a front panel locked mode is enabled, a special button combination or SIS command is required to unlock the front panel controller and make the front panel operational.

Upgradeable firmware — The firmware that controls all switcher operation can be upgraded on location through the serial port or the Ethernet port, without taking the switcher out of service. Firmware upgrades are available for download on the Extron Website, www.extron.com, and they can be installed using the Windows-based control program or the built-in HTML pages.

Button Labeling — The Extron button label software lets you create labels to place in the front panel I/O buttons, with names, alphanumeric characters, or color bitmaps. Alternatively, labels can be made with any Brother™ P-Touch™ or comparable labeler.

Operational flexibility — Operations such as input and output selection, setting of presets, and adjustment of audio levels can be performed on the front panel or via the Ethernet or serial link. The serial links allow remote control via a PC or control system. The Ethernet link allows multiple remote links with two levels of password-protection.

- **Front Panel Controls** — The front panel controls support input and output selection and grouping, preset creation and selection, RGB delay, audio gain and attenuation, and volume control (audio models).
- **Windows-based control program** — Via serial port or Ethernet remote control, the Windows-based control software provides a graphical interface and drag-and-drop or point-and-click operation.
- **Simple Instruction Set (SIS)** — SIS commands provides easy programming and operation.

Switching flexibility — The SMX provides individually buffered, independent matrix switched outputs with audio follow and audio breakaway for audio models:

- **Tie any input to any or all outputs**
- **Quick multiple tie** — Multiple inputs can be switched to multiple outputs simultaneously. This allows all displays (outputs) to change from source to source at the same time.
- **Audio follow** — Audio can be switched with its corresponding video input via front panel control, under Ethernet, RS-232 or RS-422 control, or by giving the video and audio boards the same plane address.
- **Audio breakaway** — Audio can be broken away from its corresponding video signal. This feature allows any audio signal to be selected with any video signal simultaneously to one or all outputs in any combination. Audio breakaway switching can be done via Ethernet, RS-232 or RS-422 control, or by giving the video and audio boards different plane addresses.

Installation and Cabling

This section describes how to mount the SMX frame, install the I/O boards, and connect cables to the SMX device. Topics in this section include:

- [UL Safety Requirements](#)
- [Rear Panel Features and Connections](#)
- [SMX Frame and I/O Board Installation](#)
- [Wiring the Audio Connectors](#)

UL Safety Requirements

The requirements listed below pertain to the safe installation and operation of this SMX.

Important safety instructions:

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produces heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third plug are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Rear Panel Features and Connections

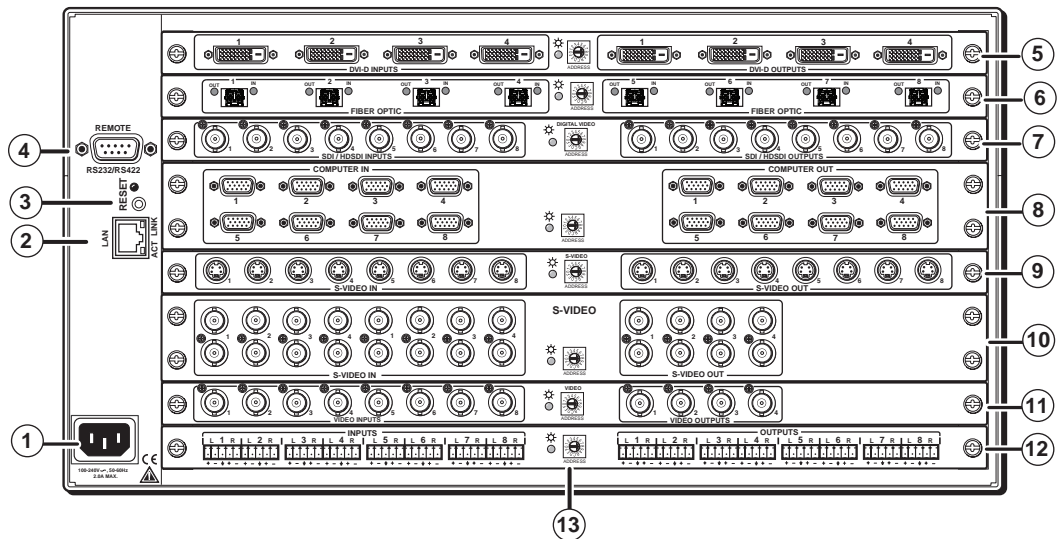


Figure 2. SMX Rear Panel Features

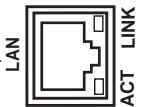
- ① AC power connector
- ② LAN Ethernet port
- ③ Reset button and LED
- ④ Remote serial port
- ⑤ to ⑫ I/O boards (optional)
- ⑬ Plane address switch

Power and Control Connections

- ① **AC power connector** — Plug a standard IEC power cord from a 100 to 240 VAC, 50 Hz or 60 Hz power source into this receptacle.



- ② **LAN Ethernet port** — Connect the switcher to an Ethernet LAN or WAN via this RJ-45 connector. Ethernet connection allows the operator to control the switcher from a remote location. When connected to an Ethernet LAN or WAN, the switcher can be accessed and operated from a computer running a standard Internet browser.



Ethernet connection indicators — The LEDs marked “Link” and “Act” indicate the status of the Ethernet connection. The green Link LED lights when the SMX is connected to an Ethernet LAN, and the amber Act LED flickers, indicating data transmission as the devices communicate.

NOTE: Do not use standard telephone cables, as they do not support Ethernet or fast Ethernet. Do not stretch or bend cables. Transmission errors can occur.

Choosing a Network Cable

Ethernet links use Category (CAT) 3, 4, 5, 5e, 6, or CAT 7 unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to 328 feet (100 m).

The cable used depends on the network speed. The SMX supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — fast Ethernet), half-duplex and full-duplex, Ethernet connections.

- 10Base-T Ethernet requires, at a minimum, CAT 3 UTP or STP cable.
- 100Base-T fast Ethernet requires, at minimum, CAT 5 UTP or STP cable.

Ethernet Cable Termination

It is essential that the Ethernet cables used be the correct type of cable and terminated with the correct pinout. The cable can be terminated as either a patch cable or a crossover cable and must be properly terminated relevant to the application (see [Ethernet Control](#) on page 106 for termination details).

- ③ **Reset button (recessed)** — Press and hold in this recessed button to reset the SMX to the default (factory setting) mode. The lit (green) LED blinks once.
- ④ **Remote port** — Connect a host device, such as a PC or touchpanel control, to the SMX via this 9-pin D connector for serial RS-232 or RS-422 control.



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	Tx	Transmit data	Tx	Transmit data (-)
3	Rx	Receive data	Rx	Receive data (-)
4	—	Not used	—	Not used
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	Rx+	Receive data (+)
8	—	Not used	Tx+	Transmit data (+)
9	—	Not used	—	Not used

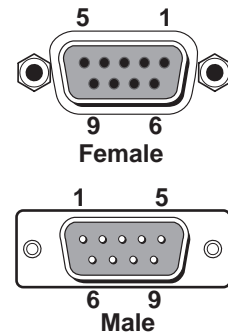


Figure 3. Remote Port Pin Assignments

- NOTES:**
- See [SIS Configuration and Control](#) on page 34 for definitions of the SIS commands, and [SMX Control Software](#) on page 59 to install and use the control software.
 - The SMX can support either RS-232 or RS-422 serial communication protocol, and can operate at 9600, 19200, 38400, or 115200 baud rates (see [Operation](#) on page 13 to configure the RS-232/RS-422 port).

Input/Output Boards

The I/O boards on any unit may vary with each installation, depending on desired configuration and use. All board types have the input and the output connectors clearly marked, and each board has a 16-position rotary switcher (see ⑬, [figure 2](#)) for setting the I/O plane address. An LED on the board indicates when power is present.

NOTE: Boards with the same plane address switch simultaneously.

[Figure 2](#) shows some, but not all, board variations that can be installed into an SMX frame. Boards have different combinations of input and output connectors, depending on the specific board installed. To install any board into an SMX frame slot (see [SMX Frame and I/O Board Installation](#) on page 10).

- ⑤ **SMX 44 DVI** — Connect DVI single link high resolution digital input devices (up to 1600 x 1200 @ 60 Hz) or HDTV devices up to 1080p, to any of the DVI-I female input connectors. Connect suitable digital display devices to the DVI-I female output connectors.



- ⑥ **SMX 44 FOX 4G MM** — Connect fiber optic input cables from a signal source to input ports and from output ports to a suitable display. LEDs light when signals are present.



- ⑦ **SMX 88 HD-SDI** — Connect SDI, HD-SDI, or dual link HD-SDI input sources to any of the BNC input connectors. Connect suitable display devices to the BNC output connectors.

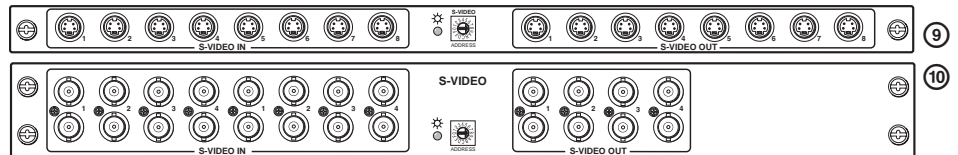


NOTE: It is recommended to terminate unused I/Os with 75 ohm terminating connectors.

- ⑧ **SMX 88 VGA** — Connect high resolution computer-video rate input sources to any of the 15-pin HD female connectors. Connect suitable display devices to the 15-pin HD output connectors.



- ⑨ **SMX 88 SV (DIN)** and ⑩ **SMX 84 YC** — Connect S-video input sources to any of the BNC pairs or 4-pin mini DIN input connectors. Connect suitable display devices to the BNC pairs or 4-pin mini DIN output connectors.



- ⑪ **SMX 84 V** — Connect composite video input signals to the BNC input connectors. Connect display devices to the BNC output connectors.



- ⑫ **SMX 88 A** — Connect stereo or mono audio input signals to any of the eight sets of 3.5 mm, 5-pole captive screw connectors marked Inputs. Wire the connector for the appropriate signal type (see [Wiring the Audio Connectors](#) on page 12).



Connect audio devices, such as an audio amplifier or powered speakers to the eight sets of 3.5 mm, 5-pole captive screw connectors marked Outputs. The connectors output the selected unamplified, line level audio (see [Wiring the Audio Connectors](#) on page 12 to properly wire an output connector).

By default, audio and video use different boards, so that audio breakaway is switched separately. This is done via the front panel, Ethernet, or the RS-232 or RS-422 link, allowing selection from any of the audio input sources. See [Operation](#) on page 13, [SIS Configuration and Control](#) on page 34, [SMX Control Software](#) on page 59, or [HTML Control and Configuration](#) on page 87 for control details.

- ⑬ **Plane address rotary switch** — This 16 position rotary switch defines a plane address for up to 16 I/O boards. To set an address, insert a small screwdriver in the slot and rotate it to the desired number (0-9, A-F). Each plane address is then identifiable during SMX control and configuration.



Other I/O Boards

SMX 84 USB

Connect host devices (such as a PC) to any of the USB Type B Hosts ports (inputs). Connect suitable USB devices (such as a mouse or keyboard) to any of the USB Type A Device Hubs ports (outputs).

- NOTES:**
- There are 3 USB hubs in series within the USB boards. Per USB specifications, up to 5 USB hubs can be used in a system.
 - USB boards cannot be cascaded.
 - Appropriate USB Type A to USB Type B cables or adapters may be required for USB Type B input signals.



Features of SMX USB boards:

Peripheral emulation — Constantly emulates an HID (Human Interface Device) compliant mouse and keyboard to any connected host without necessitating any ties to an output device. This feature facilitates a problem-free boot up and is evident in the device manager of the host PC as it constantly reports a mouse and keyboard are connected to it.

Host emulation — Emulates a host to multiple standard keyboards and mice. Connected keyboards and mice operate as one unit.

The default setting for host emulation is Off. To enable or disable host emulation (see the [USB Board SIS commands](#) on page 52 or [USB Settings/Status](#) on page 67).

- NOTES:**
- When host emulation is enabled, Device Hubs ports continually provide power to attached peripherals. However, they will not be functional until ties are made to a host.
 - Host emulation is valid through a hub or USB extender.
 - If non-HID devices are connected to the Device Hubs ports, host emulation is disabled.

Hot key switching — Routes or makes a tie between a specific input using a specific combination of key presses on an attached keyboard and an output. To make a tie, press Ctrl + Shift + <desired input to be tied>.

- NOTES:** Hot key switching can be executed only under the following conditions:
- Host emulation is enabled for the desired output.
 - The output has a "standard" keyboard (it cannot require special USB drivers) to execute the button combination for hot key switching.

KVM application — The USB and video board must be set to the same plane address in order to switch the keyboard, video, and mouse together during ties.

SMX Frame and I/O Board Installation

If the SMX is to be rack mounted, it is important to mount it before cabling it (see [Mounting the Switcher](#) on page 125).

Installing the I/O Boards

The I/O boards on any unit may vary with each installation, depending on desired configuration and use. Each board has input and output connectors that are clearly marked, and a 16-position rotary switch used to set the I/O plane address.

- NOTES:**
- The boards are hot-swappable: they can be installed or removed without turning off or disconnecting the power. However, turning the power off prior to installing or removing boards is recommended.
 - Use ESD precautions when installing a board to avoid damaging it. Keep the board in the anti-static bag until needed. Use proper grounding techniques during installation.

See [Frames and I/O Boards](#) on page 124 for a full list of available boards for the SMX.

Installing New Boards into an Empty SMX Frame

1. Remove as many of the blank plates from the rear of the unit as needed.
2. When ready, remove the board from the anti-static bag, taking care not to touch any of the components on the board. Slide the board into the open rear slot (see [figure 4](#)), carefully aligning it with the plastic slides in the frame. Push the board firmly into place.

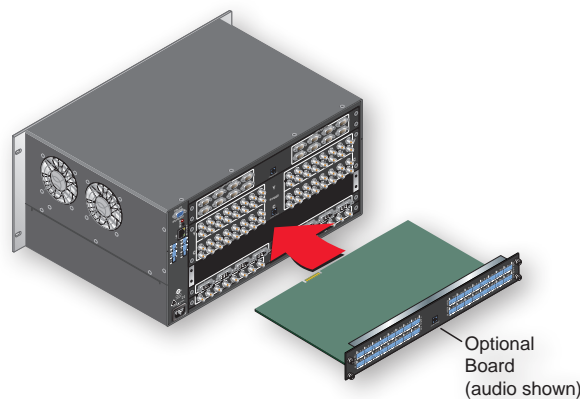


Figure 4. SMX Frame Rear Showing Board Installation

3. Tighten down the screws on each end of the board.

NOTE: Use a tool to fully tighten the screws after initial installation and subsequent removal and replacement of the boards.

4. Repeat steps 1 through 3 for all boards needing installation.

NOTE: If the unit is connected via RS-232 or RS-422, it responds with `Reconfig` when a board is installed or replaced.

The SMX is now ready for cabling (see [Input/Output Boards](#) on page 8 for details).

Replacing an Existing I/O Board

1. Remove any input and output cables for the I/O board being replaced.
2. Loosen the outer screws on the existing board and remove it from the unit.
3. Slide the replacement board firmly into place and tighten down the screws.
4. Repeat for all boards to be replaced. Any new boards are now ready for cabling.

To configure the SMX with the new cards, see [Operation](#) on page 13. For alternative configuration methods for the SMX, see [SIS Configuration and Control](#) on page 34, [SMX Control Software](#) on page 59, and [HTML Configuration and Control](#) on page 87.

Wiring the Audio Connectors

Connect audio input devices to the 3.5 mm, 5-pole captive screw connectors (up to two groups of eight sets possible).

Wire the input connectors as shown in [figure 5](#).

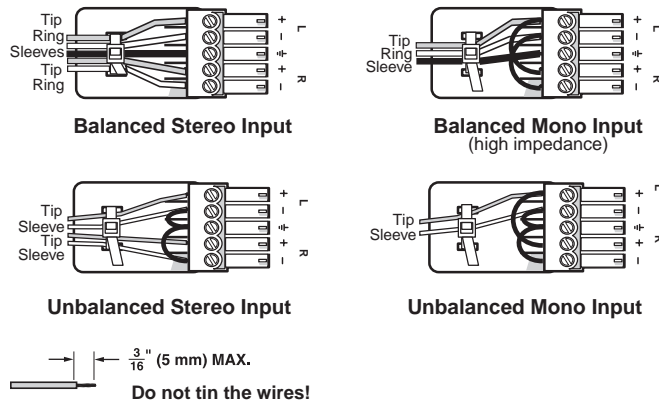


Figure 5. Captive Screw Connector Wiring for Audio Signals

NOTE: When making connections for the SMX from existing audio cables (see [figure 7](#)). A mono audio connector consists of the tip and sleeve, whereas a stereo audio connector consists of the tip, ring, and sleeve. The tip, ring, and sleeve wires are also shown above on the captive screw audio connector diagram (balanced inputs, see [figure 6](#)).

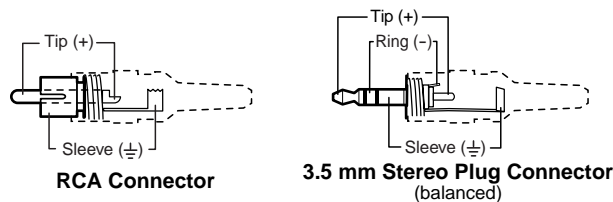


Figure 6. RCA Audio Connectors

Wire the output connectors as show in [figure 7](#).

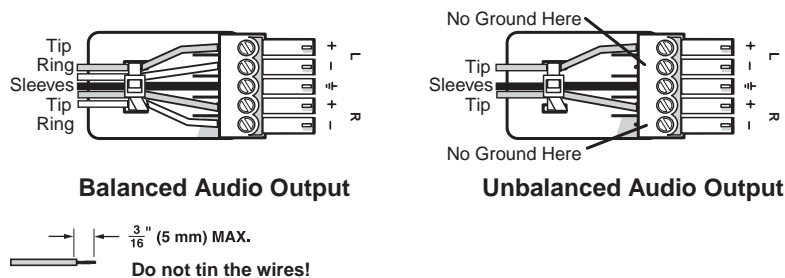


Figure 7. Captive Screw Connector Wiring for Audio Output

CAUTION: For unbalanced audio, connect the sleeves to the center contact ground. Do not connect the sleeves to the negative (-) contacts.

Operation

This section discusses the operation of an SMX series device through the front panel buttons and includes:

- [Front Panel Overview](#)
- [Powering Up](#)
- [Front Panel Operation](#)
- [Configuring the Rear Panel RS-232/RS-422 Port](#)
- [Viewing and Adjusting the Audio Input Level](#)
- [Viewing and Adjusting the Audio Output Volume](#)
- [Using Reset Levels](#)
- [Troubleshooting](#)

Front Panel Overview

SMX controls and indicators are shown in [figure 8](#). They include I/O plane selection buttons, input and output selection buttons, control buttons (Enter, Preset, View, and Esc) and power indicator LEDs for the main board and I/O cards. A 2.5 mm configuration port is also on the front panel.

All buttons can be relabelled as desired (see [Replacing Buttons Labels](#) section on page 127).

NOTE: Some models have a blank front panel (no buttons). See [SIS Configuration and Control](#) on page 33, [SMX Control Software](#) on page 58, and [HTML Configuration and Control](#) on page 86 to control and configure SMX models with blank front panels.

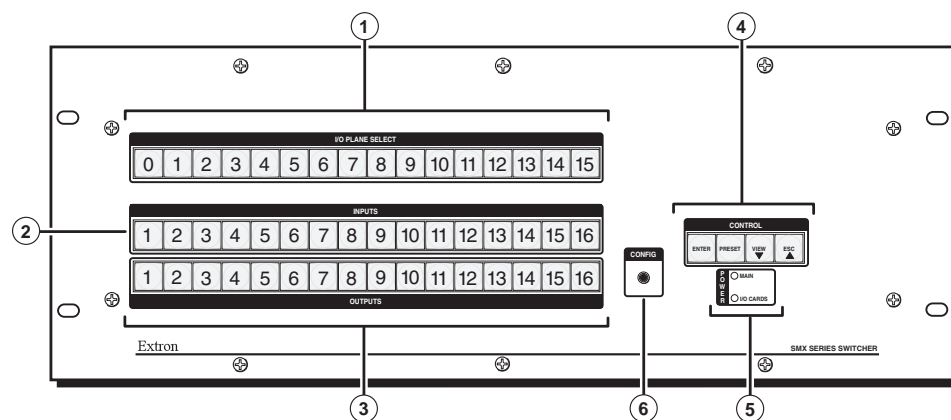


Figure 8. SMX Series Matrix Switcher Front Panel Features

- | | |
|--------------------------------------|--|
| ① I/O Plane Selection buttons (0-15) | ④ Control buttons (Enter, Preset, View, and Esc) |
| ② Inputs buttons (1-16) | ⑤ Power status LEDs |
| ③ Outputs buttons (1-16) | ⑥ Config port |

I/O Plane Selection Buttons

- ① **Plane selection buttons** — The buttons, labeled 0 through 15, allow plane selection and identify any tied inputs and outputs on the selected plane. These correspond to the board rotary switch settings.

Input and Output Buttons

- ② **Input selection buttons** — Input buttons 1 through 16 select inputs to tie to outputs, remove or replace ties, and to view ties. Any input can be tied to any output as video, audio, or both (see the [Front Panel Operation](#) on page 16 for more details).

NOTE: Input and output buttons light (or flash) green for video signals, red for audio signals, and bright amber for both video and audio signals.

Input buttons are also used to:

- Save and recall global presets (1 through 16)
- Save and recall plane presets (1 through 10)
- Display the output audio volume level
- Display RGB delay up to 5 seconds (inputs 1-10), in 0.5 second intervals, (for SMX VGA and RGBHV boards only)
- Select inputs to view or adjust the audio level of that input
- Select inputs to enable muting or unmuting of tied outputs
- Set button backlight to On or Off (press and hold inputs 1 and 2 simultaneously)
- Activate audio gain and output volume control (press any button twice, when the SMX is in view mode with an audio plane selected).

- ③ **Output selection buttons** — The output buttons 1 through 16 select the output to tie to any selected active input, and identify existing ties (video, audio, or both) active on that selected output (see [Front Panel Operation](#) on page 16 and [Viewing Ties](#) on page 18 for method).

Any output can be tied to any input as video, audio, or both (see [Front Panel Operation](#) on page 16 and [Creating Ties](#) on page 17 for more details).

Output buttons are also used to:

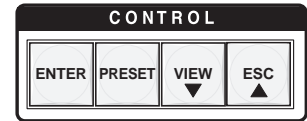
- Save and recall global presets (17 through 32, using outputs 1 through 16)
- Display the input audio level
- Show which outputs are tied to any selected input
- Select outputs for muting or unmuting
- Select an audio output for volume adjustment
- Activate audio gain and output volume control (press any button once when an audio plane is selected and flashing)

NOTE: Throughout this guide, the front panel buttons status is shown as unlit, lit, or flashing.



Control Buttons

- ④ **Control selection buttons** — These four buttons give direct access to the enter (save), preset, view, and Esc (exit) controls. Each button has a separate function.



NOTES:

- See [Configuring the Rear Panel RS-232/RS-422 Port](#) on page 26 for serial port configuration details.
- See [Setting the Front Panel Locks \(Executive Modes\)](#) on page 25 for executive modes details.

Enter button — The Enter button flashes green when a change to an input or output tie is pending, or red when a preset recall is pending. Pressing the flashing button saves the change or recalls the preset, and the Enter button and any lit input and output buttons extinguish (see [Front Panel Operation](#) on page 16).

Preset button — The Preset button gives access to recall or save up to 32 global presets (using I/O buttons 1 through 16), and 10 plane presets (using input buttons 1 through 10). The button lights red when pressed. Upon recalling or saving the preset, the button and all input and output buttons (lit red) are extinguished (see [Front Panel Operation](#) on page 16 and [Saving and Recalling I/O Presets](#) on page 22).

NOTE: Global presets save and recall the configuration for all planes. Plane presets save and recall the configurations for a specific plane without affecting the other plane connections.

View (▼) button — This button, when pressed and released, lights red and allows quick viewing of existing input and output ties. When the button is lit, after selecting a plane and an associated input, muted outputs flash and untied outputs light the appropriate signal color (red, green, or amber). Tied outputs remain unlit.

NOTE: Use this button to decrease settings for RGB delay, input audio level, and output audio volume. This button also mutes and unmutes outputs (see the [Muting or Unmuting a Video, Audio, or Video and Audio Output](#) on page 20).

Esc (▲) button — This button, when pressed, flashes green once and all lit control, plane, input, and output buttons are extinguished.

NOTE: Use this button to increase the RGB delay, input audio level, and output audio volume.

Also, when used in combination, the buttons have the following functions:

Control Button Combination				Function
Enter	Preset	View	Esc	Selects the serial port configuration.
	Preset	View	Esc	Toggles between executive modes 2x and 0x.
		View	Esc	Toggles between executive modes 2x and 1x or initiates a system reset.

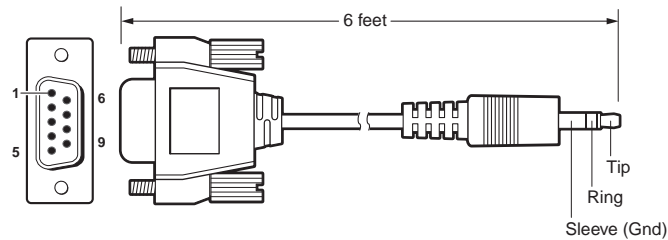
Power Indicator LEDs

- ⑤ **Power indicator LEDs** — These two LEDs, labeled Main and I/O cards, light green when power is applied to the unit. The LEDs light red when the main or redundant power supply fails.

Front Panel Configuration Port

- ⑥ **Configuration port** — This 2.5 mm port (jack) can be used to configure the SMX during setup via RS-232, and has an independent protocol from the primary RS-232 port on the rear panel. Use the 2.5 mm configuration cable, part number 70-335-01 (see [figure 9](#)) for connection to your PC serial port.

RS-232 protocol (default): 9600 baud, 1 stop bit, no parity, 8 data bits, no flow control.



9-pin D	Connection	TRS Plug
Pin 2	Computer Rx line	Tip
Pin 3	Computer Tx line	Ring
Pin 5	Computer signal ground	Sleeve

Figure 9. Front Panel 2.5 mm Port Configuration Cable

NOTE: This port does not support RS-422.

Powering Up

When power is applied to the SMX, it undergoes a start-up self testing sequence:

1. All buttons flash green, red, and then amber, before extinguishing.

NOTE: The order in which the colors are displayed may vary.

2. The two LEDs light green to indicate power is present to the main unit and I/O boards.

NOTE: This sequence also occurs when the unit restarts after firmware uploads.

Front Panel Operation

This section covers basic setup and configuration of the SMX using the front panel.

Ties — General Information

- During any operation of front panel buttons, any active input, output, and control buttons stay lit or blink for 30 seconds. If, during that 30 seconds, no button is pressed, a time-out occurs and all buttons go out. The operation must be restarted.
- To enable any selected input signal to be viewed on a display device, the input must be tied to an output on the same plane.
- An output can be tied to one input only, but an input can have multiple outputs.
- If an input with no existing tie is selected, only that input button lights when pressed. No output buttons light.
- When a plane and an input are selected, the associated output buttons flash the appropriate color to indicate tentative ties. Buttons for outputs to the selected input light steadily in the appropriate color.
- If a tie is made between an input and an output and the selected output was previously tied to another input, the older tie is broken when the Enter button is pressed.

- If any associated (lit) output button (an existing tie) is toggled off by pressing the button and the Enter button is pressed, the existing tie to that output is lost.
- Ties can be made using SIS commands via RS-232, RS-422, Telnet/HTTP, the SMX Control Software program, or the internal web pages. See [SIS Configuration and Control](#) on page 33 for RS-232 and RS-422 control, [SMX Control Software](#) on page 58 for Software, or [HTML Configuration and Control](#) on page 86 for HTTP methods.

Creating Ties

To make input ties to untied outputs:

An example of creating an input to output tie

The following shows how to create a tie (input 7 on plane 0 to output 4 in this example).

1. Press and release the Esc button to clear any pending input, output, or control button changes. The Esc button flashes green once.
2. Press and release the I/O Plane Select button for the desired configuration.

NOTE: The I/O Plane button and Input button 1 lights, indicating the signal type: green for video, red for audio, or amber for both video and audio signals. In the examples below, the plane carries a video signal only.

Step 2.

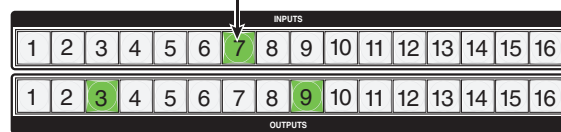
Press and release the desired I/O Plane Select button.



I/O plane and Input buttons light **green** if on a video plane, **red** if on an audio plane, or **amber** if on a video and audio plane.

Step 3.

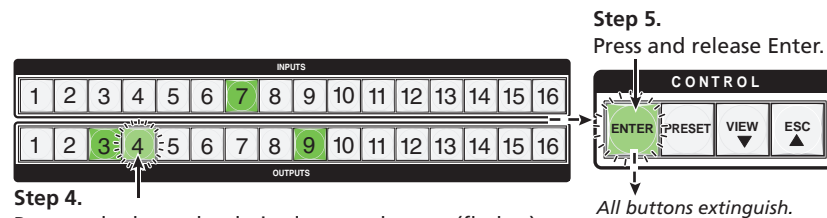
Press desired Input button (lights).



Currently tied outputs light according to the signal type of the output. Input 1 extinguishes.

Figure 10. Select I/O Plane, then an Input — an Example (Steps 2 and 3)

3. Press and release the desired input button (see [figure 10](#)). This button lights according to the plane signal type: green (video), red (audio), or amber (both).



Step 4.

Press and release the desired output button (flashes). The Enter button also flashes (green).

Step 5.

Press and release Enter.

All buttons extinguish.

Figure 11. Select the Outputs, then Press Enter — an Example (Steps 4 and 5)

4. Press and release the output buttons (see [figure 11](#)). The selected output buttons flash. The enter button flashes green.
5. Press and release the Enter button to make the tie. The plane selection, input, output, and Enter buttons all extinguish.

NOTE: Repeat steps 2 through 5 if the Enter button extinguishes before being pressed.

Viewing Ties

Any existing input to output tie can be viewed.

An example of viewing a set of video or audio ties

The following shows how to view existing ties on any allocated plane (here planes 0 and 2).

1. Press and release the View button (lights red). The last plane button used (here 0) lights green, and untied output buttons light the appropriate color for the plane signal type, (green for video, red for audio, amber for both).

NOTE: If all output buttons light, no outputs are tied. If no output buttons light, all outputs are tied. The maximum number of buttons that may light corresponds to the number of outputs on the plane card (4, 8, or 16).

Step 1.

Press the View button (lights red).

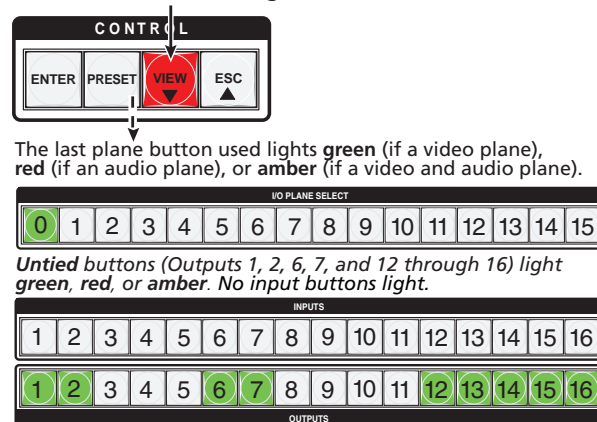
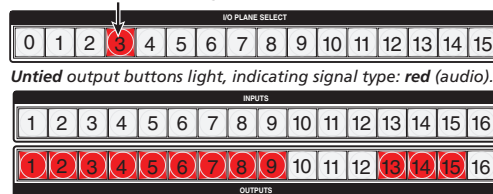


Figure 12. Viewing Ties — an Example of Untied Outputs (Step 1)

2. Press and release another plane selection button to view ties for that plane.
3. To view the input tied to it, press any of the unlit output buttons (in the example below, buttons 10 through 12, and 16). The untied output buttons extinguish, and the previously tied output buttons (10 through 12 and 16) and the associated tied input button (3) light the appropriate color (see [figure 13](#)).

Step 2.

Press plane button 3 (lights red - audio plane).



Step 3.

Press a tied output button (10).



Tied outputs (10 through 12, and 16) and associated input (3) light the same color.

Figure 13. Viewing Ties — an Example of Tied Outputs (Steps 2 and 3)

NOTE: To clear the lights after viewing, press and release the Esc button. This does not clear or change any existing ties.

Removing Ties

Any video or audio tie can be removed from an existing set of ties.

An example of removing ties from an existing set of ties

In this example, Inputs 3 on video plane 0 is already tied to outputs 2, 4, 6, and 7. The ties to outputs 4 and 7 are to be removed.

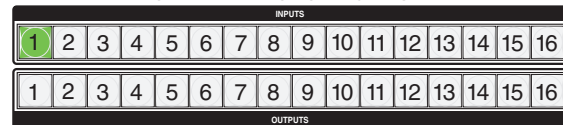
1. Press and release plane button 0 which lights green. Input button 1 lights the plane signal type: green for video, red for audio, amber for video and audio.
2. Press and release Input button 3 (lights). Tied outputs (2, 4, 6, and 7) light the same color as the input button. Input 1 extinguishes (see [figure 14](#)).

Step 1.

Press plane button 0 (lights green).

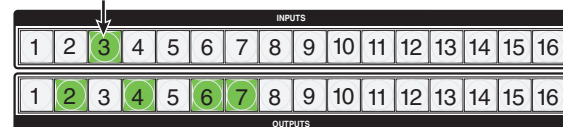


Input button 1 lights, indicating signal type: **green** (video) or **red** (audio).



Step 2.

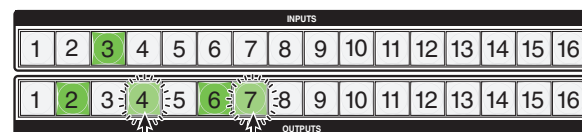
Press Input 3 button (lights).



Tied outputs (2, 4, 6, and 7) light same color, and Input 1 extinguishes.

Figure 14. Removing Ties — an Example (Steps 1 and 2)

3. Press and release outputs buttons 4 and 7. They begin flashing (indicating that they are ready for removal), and the Enter button flashes green.
4. Press and release the flashing Enter button (see [figure 15](#)). The two ties are removed, and all button lights extinguish.

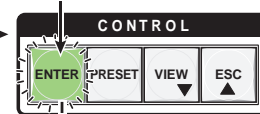


Step 3.

Press and release Output 4 and 7 (flashes).
Enter button also blinks (green).

Step 4.

Press and release the Enter button to remove



All buttons extinguish.

Figure 15. Removing Ties — an Example (Steps 3 and 4)

Replacing Ties

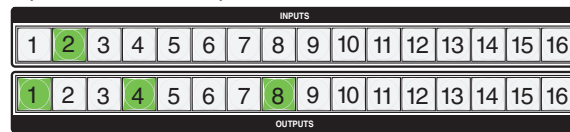
An input tied to an output can be replaced with another input, as long as that input is of a similar type or plane (for example, video for video and audio for audio).

An example of replacing an existing tied input with another input

In the following example, input 2 on video plane 0 is tied to output 1, 4, and 8. The input 2 signal to output 1 is to be replaced by the input 7 signal, also on plane 0, and already tied to outputs 3 and 6.

1. Press and release plane button 0. It lights green. Input button 1 lights, indicating plane signal type (green for video, red for audio, amber for both).
2. Press and release Input button 7, which lights. Tied output buttons (3 and 6 in this example) light the same color as the input button. The Input 1 button extinguishes.

Input 2 is tied to outputs 1, 4, and 8 (all lit).



Step 1.

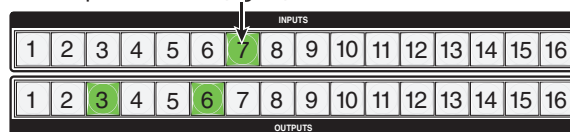
Press and release the I/O Plane 0 button. It lights **green**.



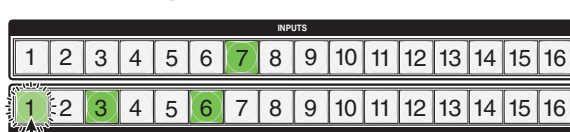
*Input button 1 lights **green** (video plane), **red** (audio plane), or **amber** (video and audio plane).*

Step 2.

Press Input button 7 (lights).



Outputs 3 and 6 light the same color as the input 7 button. Input 1 extinguishes.



Step 3.

Press and release Output 1 button (flashes). Enter blinks (**green**). All buttons extinguish.

Step 4.

Press and release Enter.

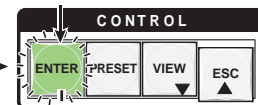


Figure 16. Replacing Ties — an Example

3. Press and release the output 1 button. This button flashes the same color as the input button, and the Enter button flashes green. The other tied buttons (3 and 6 in this example) remain lit (see [figure 16](#)).
4. Press and release the Enter button. All button lights extinguish.

Muting or Unmuting a Video, Audio, or Video and Audio Output

Any output signal can be muted or unmuted (see the [Note below](#)). Muted signals are indicated by a flashing output button when in View mode and with the selected plane buttons lit. The tie for the muted signal still exists.

NOTE: When the front panel is in lock mode 2, the output mute status can be viewed only. No changes to the mute status (muting or unmuting a signal) can be made from the front panel.

Muting an output

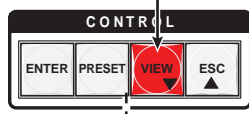
To mute an output signal, do the following:

1. Press and release the Esc button to clear all pending changes.
2. Press and release the View button, which lights red. The previously selected plane button and untied output buttons light (see [figure 17](#)), or flash if the outputs are already muted. Tied outputs remain unlit.

NOTE: For video signals, output buttons light or flash green; for audio signals, the buttons light or flash red, and for video and audio signals, the buttons light or flash amber.

Step 2.

Press and release the View button (lights red).



The last plane button used lights.

Step 3.

Press and release the desired I/O Plane (here plane 2).

The plane button and any untied outputs light. Muted outputs flash. Tied outputs remain unlit.

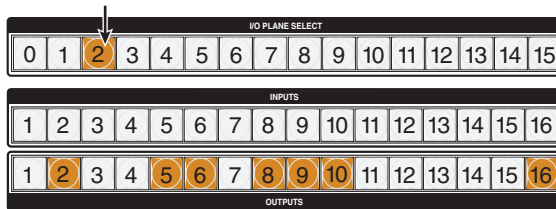


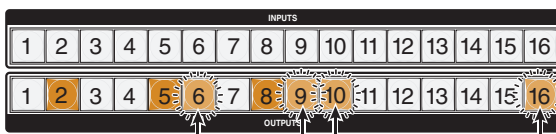
Figure 17. Muting Output Signals — an Example (Steps 2 and 3)

3. Select the applicable plane which lights. The output buttons light if they are untied or flash if they are tied and muted in the signal type color. Tied outputs remain unlit.
4. Press and hold the desired output button for 2 seconds or until the button flashes, then release. The signal is now muted (see [figure 18](#)).

NOTE: If the button flashes red, the audio signal is muted. If the button flashes green, the video signal is muted. If it flashes amber, both are muted.

Step 4.

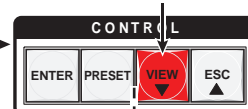
Press and hold the desired output buttons for 2 seconds.



Each selected button flashes (green, red, or amber).

Step 5.

Press and release the View button.



All buttons extinguish.

Figure 18. Muting Output Signals — an Example (Steps 4 and 5)

5. Press and release the View button. All buttons extinguish.

NOTE: For video, only RGB is muted. Sync is not muted.

Unmuting an output

To unmute an output signal, do the following:

1. Press and release the Esc button to clear all pending changes.
2. Press and release the View button, which lights red.
3. Press and hold the desired muted output button, until the button light ceases to flash and remains lit (approximately 2 seconds). The signal is now unmuted.

NOTE: Output buttons with muted signals flash the appropriate color (green for video, red for audio, or amber for both). Output buttons with unmuted signals appropriate color.

4. Press and release the View button. All buttons extinguish.

Saving and Recalling I/O Presets

The SMX has a total of 32 global preset addresses available (using I/O buttons 1 through 16) and 10 plane preset addresses (using Input buttons 1 through 10).

NOTE: A global preset saves and recalls configurations for all planes. A plane preset saves and recalls the configurations for a specific plane without affecting the other plane connections.

Each global preset can be saved and recalled using the front panel input and output buttons, with presets 1 through 16 assigned to the input buttons and presets 17 through 32 assigned to the output buttons. Likewise, plane presets are saved to and recalled from input buttons 1 through 10. Any current tie configuration can be saved to any one of the preset locations, in any order. Saving the current configuration to an existing preset overwrites the existing preset with the new configuration.

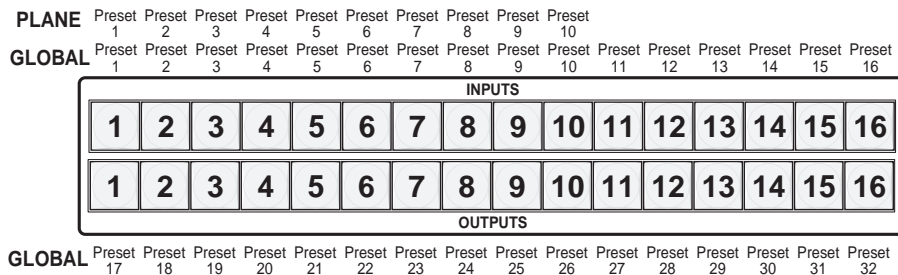


Figure 19. Preset Addresses

When a preset is recalled, it replaces the current (active) configuration, which is then lost unless already saved to a different preset location. The recalled preset overwrites all of the current configuration ties, with the recalled configuration.

- NOTES:**
- Presets **cannot** be viewed from a front panel unless recalled as the current configuration. Presets can be seen using the Windows based SMX Control Program.
 - The current configuration and all other presets are stored in non-volatile memory. When power is removed and restored, the current configuration remains active and all presets are retained.
 - Ties for all I/O planes are stored and recalled. Audio gain settings are not saved with the preset and do not change when a preset is recalled.
 - When the plane preset mode is active, input buttons light for all saved presets.

Saving or recalling a global preset

1. Press the Esc button to clear all pending changes. The button flashes green once.
2. **Saving a global preset** — Press and **hold** the Preset button until it flashes red.

OR

Recalling a global preset — Press and **release** the Preset button (lights red). All previously saved presets also light red.

Step 2.

To save a global preset, press and **hold** the Preset button until it flashes red.

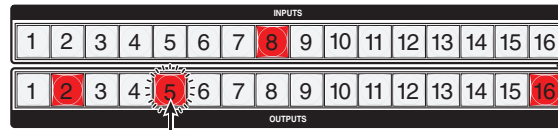
Buttons for any previously saved presets light red (here preset 8, 18, and 32).



NOTE: To recall a global preset, press and release the Preset button (lights red).

Step 3.

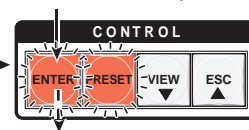
Press and release the desired (unlit or lit) input or output button (here output 5, preset 21). The button flashes red.



Enter button also blinks (red).

Step 4.

Press the Enter button to save or recall preset.



All buttons extinguish.

NOTE: To recall a global preset, press and release a lit Preset button.

Figure 20. Saving or Recalling a Global Preset — An Example (Steps 2 through 4)

3. Press and release a desired input or output button to select the address to save the current configuration to. The Address, Preset, and Enter buttons flash red.

NOTE: A preset can be saved to any lit or unlit button. Only presets with lit buttons can be recalled. When a preset is saved to a lit (previously saved button, the stored data is overwritten with the new data. Only one preset can be saved to an address at a time.

4. Press and release the Enter button. The preset is saved or recalled as specified.

Saving or recalling a plane preset

1. Press the Esc button to clear all pending changes. The button flashes green once.
2. **Saving a plane preset** — Press and **hold** the Preset button until it flashes red, then select a plane.

OR

Recalling a plane preset — Press and **release** the Preset button, which lights red. All previously saved presets light red, then select a plane.

NOTE: Lit presets are global presets, not plane presets.

3. Press and release a plane button. The button lights.

NOTE: The lit buttons for global presets extinguish, and the buttons for any saved plane presets light.

4. Press and release the desired input button (1-10) to select the plane preset address to save the current configuration to. The Address, Preset, and Enter buttons flash red.

NOTE: A preset can be saved to any lit or unlit input button (1 through 10). Only presets with lit buttons can be recalled. When a preset is saved to a lit button (already containing a preset), the stored data is overwritten with the new data. Only one plane preset can be saved to an address at a time.

5. Press and release the Enter button. The plane preset is saved or recalled.

Step 3.

Press desired plane button (here plane 0).

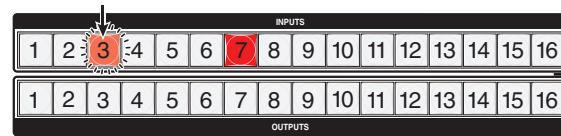


Plane button lights **green**.

Buttons for any previously saved plane presets light **red** (here preset 7).

Step 4.

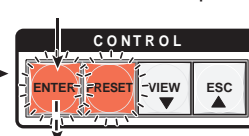
Press and release the desired (unlit or lit) input button 1-10 (here preset 3). The selected button flashes **red**.



Enter button also blinks (**red**).

Step 5.

Press the Enter button to save or recall the preset.



All buttons extinguish.

NOTE: To recall a plane preset, press and release the Preset button. Select a plane, then press and release a lit preset button.

Figure 21. Saving or Recalling a Plane Preset — an Example (Steps 3 through 5)

Setting RGB Delay (VGA and RGBHV Boards Only)

NOTE: This feature is applicable only for VGA and RGBHV boards and can not be set via the front panel when the SMX is in lock modes 1 or 2.

1. Press the Esc button to clear all pending changes. The button flashes green once.
2. Select a **VGA** or **RGBHV** plane.
3. Press and hold View for 3 seconds. The selected plane button flashes green.
4. Select the output to delay. The button lights.
5. Using View (▼) and Esc (▲), adjust the time duration for the delay (up to 5 seconds maximum). Each lit input button corresponds to a half-second delay.

NOTE: No input buttons lit signifies zero delay, 10 buttons lit signifies 5 seconds delay.

Step 2.

Press and release a **VGA** or **RGBHV** plane button (lights **green** or **amber**).



Step 3.

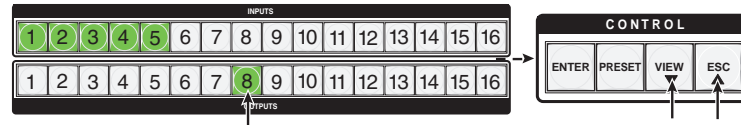
Press and **hold** the View button until the plane button flashes



Step 4.

Press and release the output button to be delayed (here output 8).

Input buttons light to show the current RGB delay (here 2.5 seconds).



Step 5. Press View to decrease or Esc to increase the delay.
The maximum RGB delay is 5 seconds.

Figure 22. Setting RGB Delay — an Example (Steps 2 through 5)

6. Press and release the Enter button to save the settings and exit the RGB delay mode.

Setting the Front Panel Locks (Executive Modes)

The SMX has three levels of front panel security lock that limit the operation of the switcher from the front panel. The three levels are:

- **Lock mode 0X** — The front panel is completely unlocked, and all front panel controls are available. Basic and advanced features are available.
- **Lock mode 1X** — All changes are locked from the front panel (except for setting Lock mode 2). Only View mode is available.
- **Lock mode 2X** — Basic functions are unlocked. Advanced features are locked and can be viewed only (default mode).

Basic features consist of:

- Making ties
- Saving and recalling presets
- Setting input audio gain and attenuation
- Changing Lock modes

Advanced features consist of:

- Setting video and audio output mutes
- Setting audio output volume
- Setting RGB delay (VGA, RGBHV boards)
- Setting the rear panel report port protocol and baud rate

NOTE: The SMX is shipped from the factory in lock mode 2 (see [SIS Configuration and Control](#) on page 33 to set lock modes using SIS commands).

Selecting lock mode 2 or toggling between mode 2 and mode 0

- NOTES:**
- If the SMX is in lock mode 0, this procedure selects mode 2. The Preset, View, and Esc buttons flash green twice.
 - If the SMX is in lock mode 2, this procedure selects mode 0 (unlocks the switcher). The View and Esc flash green twice.

Toggle the lock on or off by pressing and holding the Preset, View, and Esc buttons simultaneously until the buttons flash (approximately 2 seconds).

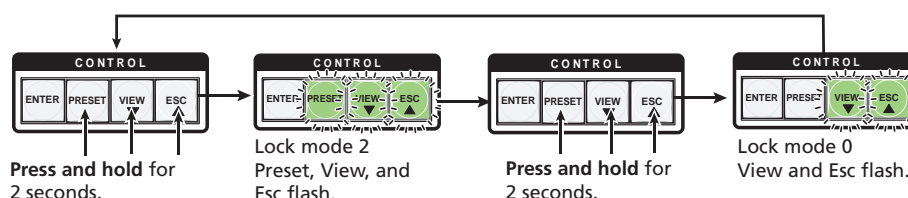


Figure 23. Setting the Executive Lock Mode 2

Selecting lock mode 1 or toggling between mode 2 and mode 1

- NOTES:**
- If the SMX is in Lock mode 1, this procedure selects mode 2. The Preset, View, and Esc buttons flash green twice.
 - If the SMX is in Lock mode 2, this selects mode 1. The View, and Esc buttons flash green twice.

Toggle the lock on and off by pressing and holding the View and the Esc button simultaneously until the buttons flash (approximately 2 seconds).

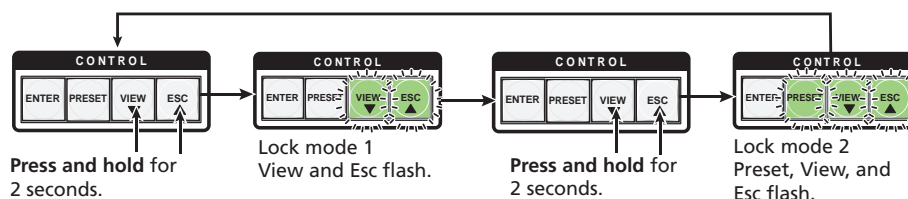


Figure 24. Setting the Executive Lock Mode 1

Setting Background Illuminations

The background illumination can be toggled on or off (default state) as desired from the front panel. When the background illumination is on, the buttons are lit 25% amber. To toggle button background illumination off or on, do the following.

- Press and hold inputs 1 and 2 simultaneously, for 3 seconds. All buttons extinguish if lit amber, or light amber if already off.

NOTE: When in lock mode 1, background illumination cannot be changed.

Configuring the Rear Panel RS232/RS422 Port

The SMX rear panel 9-pin D com port can be configured through the front panel using the Control buttons and I/O plane buttons 0 and 1.

NOTE: RS-232 or RS-422 configuration via the front panel is not possible when the unit is in lock mode 2.

The port can also be configured using SIS commands via Telnet, RS-232, or RS-422 (see [SIS Configuration and Control](#) on page 33 for using SIS commands).

Using the Front Panel

NOTE: This function is available only when the unit is in Lock mode 0.

1. Press and hold the Enter, Preset, View, and Esc buttons simultaneously until the control buttons and I/O plane buttons 0 and 1 light.
2. Use the control buttons to select the baud rate:
 - Enter = 9600 • Preset = 19200 • View = 38400 • Esc = 115200The selected baud rate button flashes.
3. Use the I/O plane buttons (0 and 1) to select the connection type. The selected connection type button flashes.
 - I/O plane button 0 = RS-232 • I/O plane button 1 = RS-422
4. Press any input or output button to exit configuration mode.

Viewing and Adjusting the Audio Input Level

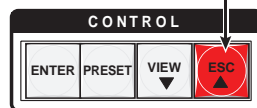
The audio level of each input can be displayed and adjusted through a range of -18 dB through +24 dB. It can be adjusted from the front panel, through RS-232 or RS-422, or through Ethernet (see [SIS Configuration and Control](#) on page 33 to make adjustments using SIS commands).

Using the Front Panel

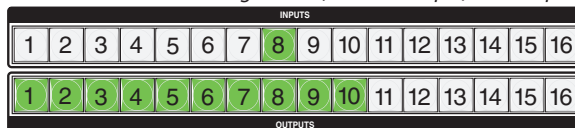
1. Press and release the Esc button to clear all pending changes (flashes green once).
2. Select the audio plane to be viewed and adjusted. The button lights red or amber.
3. Press and hold any I/O button until the audio plane button flashes red (approximately 2 seconds), and then release the button. All I/O buttons extinguish.
4. Press and release a desired input button. It lights green. The input audio level is displayed by the lit and flashing output buttons (see the [Audio Input Level Adjustment Lighting Table](#) on page 28 for button lighting and dB lighting) and the color indicates the polarity (+ is green; – is red).
5. Press and release the View (▼) button for attenuation (–), and Esc (▲) button for gain (+) to increase or decrease the audio level (see [figure 25](#)).

See the [Audio Input Level Adjustment Lighting Table](#) on page 28 for a table of audio level settings.

Step 5 – Press and hold View to decrease or Esc to increase audio level.



Selected control button lights red (in this example, Esc was pressed).



Selected input button remains lit. Outputs light, flash, or go out as the level changes. Here the dB is raised to +20 dB. Outputs 1-10 are lit green. Additional inputs can be adjusted by repeating steps 4 and 5.

Figure 25. Adjusting the Input Audio Levels — an Example (Steps 5 and 6)

6. If desired, select additional inputs can be set by pressing their input button.
7. Press and release the Enter button (or wait 30 seconds) to exit the audio display and adjustment mode. The audio plane button extinguishes.

NOTE: There is only one audio level setting per input on a specific plane. It is shared by the left and right audio inputs. The audio levels are stored in non-volatile memory. When power is removed and restored, they are retained.

If the audio is set to “follow-all” upon initial selection in step **2**, the I/O plane and associated input and output buttons light amber. When an input or output button is held for 2 seconds (step **3**), the I/O plane button flashes red.

Audio Input Level Adjustment Lighting											
dB Level	Color	Buttons Lit or Flashing	+/-	dB Level	Color	Buttons Lit or Flashing	+/-	dB Level	Color	Buttons Lit or Flashing	+/-
24	green	12	▲	9	green	5 flash	▲	-6	red	3 flash	▼
23	green	12 flash	▲	8	green	4	▲	-7	red	4 flash	▼
22	green	11	▲	7	green	4 flash	▲	-8	red	4 flash	▼
21	green	11 flash	▲	6	green	3	▲	-9	red	5 flash	▼
20	green	10	▲	5	green	3 flash	▲	-10	red	5 flash	▼
19	green	10 flash	▲	4	green	2	▲	-11	red	6 flash	▼
18	green	9	▲	3	green	2 flash	▲	-12	red	6 flash	▼
17	green	9 flash	▲	2	green	1	▲	-13	red	7 flash	▼
16	green	8	▲	1	green	1 flash	▲	-14	red	7 flash	▼
15	green	8 flash	▲	0		not lit		-15	red	8 flash	▼
14	green	7	▲	-1	red	1 flash	▼	-16	red	8 flash	▼
13	green	7 flash	▲	-2	red	1 flash	▼	-17	red	9 flash	▼
12	green	6	▲	-3	red	2 flash	▼	-18	red	9	▼
11	green	6 flash	▲	-4	red	2 flash	▼				
10	green	5	▲	-5	red	3 flash	▼				

Viewing and Adjusting the Audio Output Volume

NOTE: This function is only available when the unit is in lock mode 0.

The audio output volume of each output can be displayed and adjusted through a range of 64 steps (1 dB per step, 0% through 100%). The audio output volume can be adjusted from the front panel, through RS-232 or RS-422, or through Ethernet.

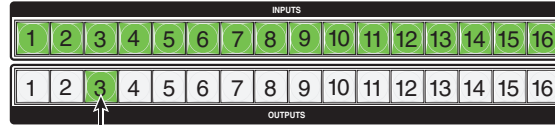
NOTE: See the SIS tables in [SIS Configuration and Control](#) on page 33 for adjustment methods using SIS commands.

Using the Front Panel

1. Press and release the Esc button to clear all pending changes. The button flashes green once.
2. Select the audio plane to be viewed or adjusted. The button lights red or amber.
3. Press and hold any I/O button until the audio plane button flashes red (approximately 2 seconds), and then release the button. All I/O buttons extinguish.

4. Press and release a desired output button. The button lights green. The output audio volume (relative volume) is indicated by the number of lit input buttons. All buttons lit indicates no (zero) attenuation.
5. Press and release the Esc (▲) and View (▼) buttons to increase or decrease the output audio volume (see the [Audio Output Volume Lighting Table](#) on page 30 for settings).
6. If desired, select additional outputs by pressing their output buttons.
7. Press and release the Enter button (or wait 30 seconds) to exit the audio display and adjustment mode. The audio plane button extinguishes.

Step 4 – Press the button for the output needing the audio volume adusted (here 3).

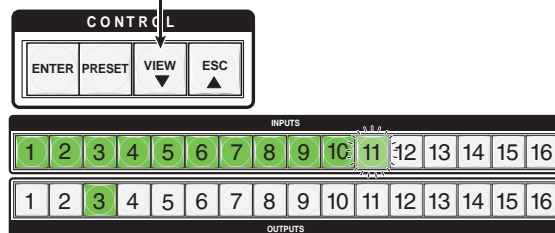


*The selected output button lights **green**.*

The current audio volume is indicated by the lit and flashing input buttons.

*Here input buttons 1-16 lit **green** indicate an output volume of 100% (0 dB attenuation).*

Step 5 – Press and hold View to decrease or Esc to increase audio level (here View).



The selected output button remains lit. Inputs light, flash, or go out as the volume changes.

*Here the volume is decreased to 65.5%. Inputs 1-10 are lit **green**, and 11 is flashing slowly.*

Additional outputs can be adjusted by repeating steps 4 and 5.

Step 6 – Press Enter to leave the output audio volume adjustment mode.

All buttons go out.

Figure 26. Adjusting the Output Volume — an Example (Steps 4 through 6)

NOTE: There is only one audio volume setting per output on any specific plane. The audio volume is shared by the left and right audio outputs. The audio volume is stored in non-volatile memory. When power is removed and restored, the audio volume settings are retained.

If the audio is set to “follow-all,” upon initial selection (step 2) the I/O plane and associated input and output buttons light amber. When an input or output button is held for 2 seconds (step 3), the I/O plane button flashes red.

Audio Output Volume Adjustment Lighting							
Volume %	dB Attenuation	Buttons Lit or Flashing	SIS command	Volume %	dB Attenuation	Buttons Lit or Flashing	SIS command
100	0	16	plane*out# *64V	52.0	32	8	plane*out# *32V
98.5	1	16	63	50.5	33	8	31
97.0	2	flash slowly	62	49.0	34	flash slowly	30
95.5	3	flash slowly	61	47.5	35	flash slowly	29
94.0	4	15	60	46.0	36	7	28
92.5	5	15	59	44.5	37	7	27
91.0	6	flash slowly	58	43.0	38	flash slowly	26
89.5	7	flash slowly	57	41.5	39	flash slowly	25
88.0	8	14	56	40.0	40	6	24
86.5	9	14	55	38.5	41	6	23
85.0	10	flash slowly	54	37.0	42	flash slowly	22
83.5	11	flash slowly	53	35.5	43	flash slowly	21
82.0	12	13	52	34.0	44	5	20
80.5	13	13	51	32.5	45	5	19
79.0	14	flash slowly	50	31.0	46	flash slowly	18
77.5	15	flash slowly	49	29.5	47	flash slowly	17
76.0	16	12	48	28.0	48	4	16
74.5	17	12	47	26.5	49	4	15
73.0	18	flash slowly	46	25.0	50	flash slowly	14
71.5	19	flash slowly	45	23.5	51	flash slowly	13
70.0	20	11	44	22.0	52	3	12
68.5	21	11	43	20.5	53	3	11
67.0	22	flash slowly	42	19.0	54	flash slowly	10
65.5	23	flash slowly	41	17.5	55	flash slowly	9
64.0	24	10	40	16.0	56	2	8
62.5	25	10	39	14.5	57	2	7
61.0	26	flash slowly	38	13.0	58	flash slowly	6
59.5	27	flash slowly	37	11.5	59	flash slowly	5
58.0	28	9	36	10.0	60	1	4
56.5	29	9	35	8.5	61	1	3
55.0	30	flash slowly	34	7.0	62	flash slowly	2
53.5	31	flash slowly	plane*out# *33V	5.5	63	flash slowly	plane*out# *1V
				0	76	not lit	0

Using Reset Levels

The SMX can be returned to default settings by choosing certain reset modes. This can be done via the front panel or the recessed Reset button on the rear panel (see ③ on [page 8](#)).

Using the Front Panel

The front panel reset is identical to the **[Esc]ZXXX← SIS** command (see the [Reset Switcher SIS](#) command on page 51). This clears all ties, presets, and mutes; resets all RGB delay to 0 seconds; resets all input audio levels to unity gain (0 dB); and sets all output volume levels to 100% (0 dB of attenuation).

NOTE:

- This system reset does not reset the Internet protocol (IP) settings or replace user-installed firmware.
- To save settings, use the SMX Control Program and the **File > Save MATRIX settings as...** command (see [Save MATRIX settings as...](#) on page 63).

To initiate the reset, perform the following:

1. If necessary, disconnect the power.
2. Press and **hold** the View and Esc buttons while reapplying AC power to the SMX.

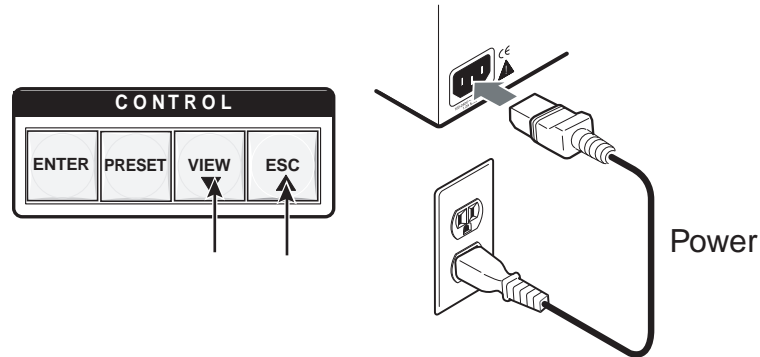


Figure 27. Front Panel System Reset

3. Continue to hold the View and Esc buttons until the SMX properly powers up (see [Powering Up](#) on page 16) and then release the buttons.

Using the Rear Panel

The recessed reset button on the rear panel initiates four levels of resets (numbered 1, 3, 4, and 5). Use a pointed stylus or Extron Tweezer to press it and select a reset level (see the [Reset Modes Table](#) on page 32 for the modes). If the reset button is continuously held down, the I/O light blinks every 3 seconds as the next reset level is reached, corresponding to modes 3, 4, and 5. Use mode 1 if compatibility issues arise with user-loaded firmware.

CAUTION: After a mode 1 reset is performed, update the firmware to the latest version. Do not operate the SMX with the firmware version that results from the mode 1 reset. To use the factory default firmware, upload that version again.

If mode 1 is selected by mistake, cycle power to the SMX to return to the firmware version that was running before the reset. Use the **00 SIS** command to confirm that the factory default firmware is no longer running (look for the asterisk [*] following the version number).

- Use mode 3 to restart the communication and control events.
- Use mode 4 to reset most IP protocols to their default settings.
- Use mode 5 to restore the switcher to the default conditions.

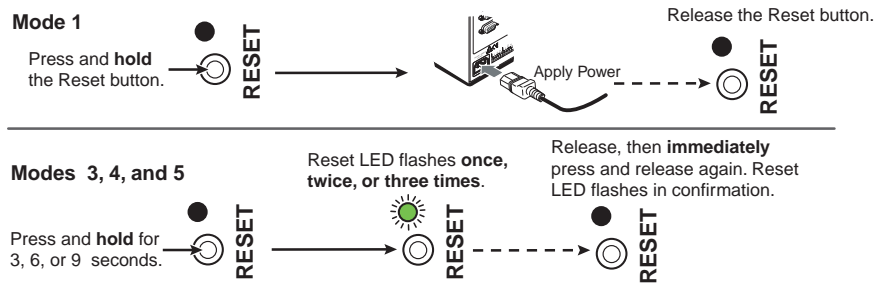


Figure 28. Resetting the SMX

CAUTION: Review the reset modes carefully. Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or processor reboot.

NOTE: The reset modes listed in the table below close all open IP and Telnet connections and all sockets. Each mode is a separate function, not a continuation from mode 1 to mode 5.

SMX Series MultiMatrix Switcher Reset Mode Summary			
	Mode Activation	Result	Purpose/Notes
Use Factory Firmware	<p>1. Hold down the recessed Reset button while applying power to the SMX.</p> <p>NOTE: After a mode 1 reset is performed, update the SMX firmware to the latest version. Do not operate the firmware version that results from this mode reset. If you want to use the factory default firmware, upload that version again (see page 83 or page 96 for details on uploading firmware).</p>	<p>The SMX reverts to the factory default firmware. Event scripting does not start if the SMX is powered on in this mode. All user files and settings (drivers, adjustments, IP settings, and so on) are maintained.</p> <p>NOTE: If you do not want to update firmware, or if you performed a mode 1 reset by mistake, cycle power to the SMX to return to the firmware version that was running prior to the mode 1 reset. Use the <code>00 SIS</code> command to confirm that the factory default firmware is no longer running (look for asterisks following the version number).</p>	<p>This mode reverts to the factory default firmware version if incompatibility issues arise with user-loaded firmware.</p> <p>NOTE: User-defined web pages may not work correctly if using an earlier firmware version.</p>
Run/Stop Events	<p>3. Hold down the Reset button for about 3 seconds until the Power LED flashes once, then release and press Reset momentarily (less than 1 second).</p>	<p>This mode turns events on or off.</p> <p>NOTE: Nothing happens if the momentary press does not occur within 1 second.</p>	<p>This mode is useful for troubleshooting.</p>
Reset All IP Settings	<p>4. Hold down the reset button for about 6 seconds until the Power LED flashes twice (once at 3 seconds and again at 6 seconds). Then release and press Reset momentarily (for less than 1 second).</p> <p>NOTE: Nothing happens if the momentary press does not occur within 1 second.</p>	<p>This Mode:</p> <ul style="list-style-type: none"> Enables ARP capability. Sets the IP address back to factory default (192.168.254.254). Sets the subnet back to factory default. Sets the default gateway address to factory default. Sets port mapping back to factory default. Turns DHCP off. Turns events off. 	<p>This mode enables you to set IP address information using ARP and the MAC address.</p>
Reset to Factory Defaults	<p>5. Hold down the Reset button for about 9 seconds until the Power LED flashes three times (once at 3 seconds, again at 6 seconds, and then at 9 seconds). Then release and press Reset momentarily (for less than 1 second) within 1 second.</p>	<p>This mode performs a complete reset to factory defaults (except the firmware).</p> <ul style="list-style-type: none"> Does everything mode 4 does. Removes button or touchpanel configurations. Resets all IP options. Removes scheduling settings. Removes all files from the SMX. 	<p>This mode is useful if you want to start over with configuration and uploading, and also to replace events.</p>

Troubleshooting

This section gives recommendations for general checks and actions for problems operating the SMX. It also describes an actual image problem that Extron has encountered.

1. Ensure that all devices are plugged in and powered on. The SMX is receiving power if one of the front panel Power Supply LEDs is lit green.
2. Check to see if one or more outputs are muted.
3. Ensure that an active input is selected for output on the SMX.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Call the Extron S3 Sales and Technical Support Hotline if necessary (see the [rear cover](#) for the contact phone numbers in your region of the world).

SIS Configuration and Control

The SMX can be configured and operated using the Extron Simple Instruction Set (SIS) of commands. SIS commands can be run from a PC connected to either of the SMX serial ports or the Ethernet port.

This section describes the SIS command method of communication and control. Topics that are covered, includes:

- [RS-232/RS-422 Link](#)
- [Ethernet \(LAN\) Port](#)
- [SIS Programming Guide](#)
- [Using the Command/Response Table for IP SIS Commands](#)

RS-232 or RS-422 Link

The SMX has two ports that can be used for serial control. The default protocols for both serial ports: 9600 baud, 1 stop bit, no parity, no flow control, 8-bit (see ② on [page 7](#), ④ on [page 8](#), or ⑥ on [page 16](#) for connection details).

Ethernet (LAN) Port

The Ethernet connection makes SIS control of the SMX possible using a computer connected to the same LAN or WAN. The SIS commands and behavior of the unit are identical whether it is communicating via Ethernet, RS-232 or RS-422 (see [page 7](#) for details of host device connection through the RS-232 or Ethernet ports).

Ethernet Cable

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see [Ethernet Control](#) on page 106).

Default IP Addresses

To access the SMX via the Ethernet port, you need the Extron IP address, and may need the subnet mask and the gateway address. If the IP address has been changed to an address comprised of words and characters, the actual numeric IP address can be determined using the ping (CMP) utility (see [Ethernet Control](#) on page 106). The factory-specified defaults are:

IP address: 192.168.254.254, subnet mask: 255.255.0.0, gateway address: 0.0.0.0

Establishing an Ethernet Connection

Establish a network connection to the SMX as follows:

1. Open a TCP socket to port 23 using the SMX IP address.

NOTE: If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.

The SMX responds with a copyright message including the date, the name of the product, firmware version, part number, and the current date/time.

NOTES:

- If the SMX is not password-protected, the device is ready to accept SIS commands immediately after it sends the copyright message.
- If the SMX is password-protected, a **Password** prompt appears below the copyright message.

2. If the SMX is password-protected, enter the appropriate administrator or user password.
3. If the password is accepted, the SMX responds with **Login User** or **Login Administrator**.
4. If the password is not accepted, the **Password** prompt reappears.

Connection Timeouts

The Ethernet link times out after a designated period of no communication. By default, this timeout value is set at 5 minutes but the value can be changed (see the **Configure global IP port timeout** command on page 58).

NOTE: Extron recommends leaving the default timeout at five minutes and periodically issuing the **Query (Q)** command to keep the connection active. If there are long idle periods, Extron recommends disconnecting the socket and reopening the connection when another command must be sent.

Number of Connections

An SMX can have up to 200 simultaneous TCP connections, including all http sockets and Telnet connections. When the connection limit is reached, the SMX accepts no new connections until some have been closed. No error message or indication is given that the connection limit has been reached. To maximize performance of an IP Link device, the number of connections should stay low and unnecessary open sockets should be closed.

Using Verbose Mode

Telnet connections to the SMX can be used to monitor changes that occur on the switcher, such as front panel operations and SIS commands from other Telnet sockets or a serial port. For a Telnet session to receive change notices from the SMX, the Telnet session must be in verbose mode 1 or 3 (see the **Set verbose mode** command on page 57).

SIS Programming Guide

Host-to-SMX and SMX-to-Host Communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the SMX determines that a command is valid, it executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF = **↵**), which signals the end of the response character string. A string is one or more characters.

Switcher-Initiated Messages

When a local event such as a front panel operation occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below.

With an RS-232 or RS-422 connection to a computer (upon power up):

(c) Copyright 2009, Extron Electronics SMX, Vx.xx, 60-XXX-01
Reconfig

With an Ethernet connection:

(c) Copyright 2009, Extron Electronics SMX, Vx.xx, 60-XXX-01
Ddd, DD MMM YYYY HH:MM:SS (day, date time as in Tue, 14 Apr 2009 14:43:17)

The SMX initiates the copyright message when powered on or when connection via Internet Protocol (IP) is established. Vx.xx is the firmware version number.

↵Password:

The SMX initiates the password message immediately after the copyright message when the controlling system is connected using TCP/IP or Telnet and the SMX is password protected. The SMX requires an administrator or user level password before performing the commands entered.

NOTE: The Password prompt is re-displayed if an incorrect password is entered.

↵Login Administrator↵and↵Login User↵

The SMX initiates the login message when a correct administrator or user password has been entered. If the user and administrator passwords are the same, the switcher defaults to administrator privileges.

Qik↵

The SMX initiates the Qik message after front panel switching.

Rprnn↵

The SMX initiates the Rpr message when a memory preset has been recalled from the front panel. "nn" is the preset number.

Sprnn↵

The SMX initiates the Spr message when a memory preset has been saved from the front panel. "nn" is the preset number.

Reconfig↵

The SMX sends the Reconfig message whenever power is cycled, the plane address is changed, or the output board is installed or uninstalled.

NOTE: The response given is seen via an RS-232 or RS-422 connection only.

ppInnn Audxx↵

The SMX initiates the Aud message when a front panel input audio level change has occurred. "pp" is the plane address, "nn" is the output number, and "xx" is the dB level.

ppOutnn Volxx↵

The SMX initiates the Vol message when a front panel output audio volume change has occurred. "pp" is the plane address, "nn" is the output number, and "xx" is the volume level.

*ppVmtnn*x*↵

The SMX initiates the Vmt message when a video output mute is toggled on or off from the front panel. "pp" is the plane address, "nn" is the output number, and "x" is the mute status: 1 = on, 0 = off.

*ppAmtnn*x*↵

The SMX initiates the Amt message when an audio output mute is toggled on or off from the front panel. "pp" is the plane address, "nn" is the output number, and "x" is the mute status: 1 = on, 0 = off.

Exen↵

The SMX initiates the Exe message when executive mode is toggled on or off from the front panel. "n" is the executive mode status: 1 = on, 0 = off.

Switcher Error Responses

When the SMX receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the command is invalid or contains invalid parameters, the SMX returns an error response to the host. The error response codes are:

- E01 — Invalid input channel number (out of range)
- E10 — Invalid command
- E11 — Invalid preset number
- E12 — Invalid output number/port number
- E13 — Invalid parameter (out of range)
- E14 — Command not available for this configuration
- E17 — Timeout (only caused by direct write of global presets)
- E22 — Busy
- E24 — Privilege violation (Ethernet and Extron software only)
- E25 — Device not present
- E26 — Maximum number of connections exceeded
- E27 — Invalid event number
- E28 — Bad filename/File not found

Using the Command and Response Table for SIS Commands

The [Command and Response Table](#) begins on page 42. Lowercase letters are acceptable in the command field except where indicated. [Figure 29](#) shows the hexadecimal equivalent of ASCII characters used in the command and response tables.

ASCII to Hex Conversion Table																Esc	1B	CR	0D	LF	0A
Space →	20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27						
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F						
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37						
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F						
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47						
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F						
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57						
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F						
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67						
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F						
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77						
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F						

Figure 29. ASCII to Hexadecimal Conversion

Symbols are used throughout the table to represent variables in the command and response fields. Command and response examples are shown throughout the table.

Symbol definitions

↵	= Carriage return and line feed
| or ←	= Carriage return with no line feed
•	= Space
Esc or W	= Escape key

NOTE: Input and output numbers in commands may be entered as either 1, 2, or 3-digit numbers. All input and output numbers are reported as 2-digit numbers in the response. (for example, 03 for input 3).

X1	= Input number	01 – <maximum number of inputs>
X2	= Input number for ties	01 – <maximum number of inputs> 00 = untied
X3	= Output number	01 – <maximum number of outputs>
X4	= Numeric dB value	-18 – +24 (45 steps of gain attenuation)
X5	= Audio gain	0 – 24 (measured in dB)
X6	= Audio attenuation	1 – 18 (measured in dB)
X7	= Volume adjustment range	0 – 64 (0% – 100% in 1 dB steps except from 1 to 0 which is in 0.34 dB steps)
X8	= Fiber optic transceiver module	0 = no module installed 1 = disabled front panel 2 = enabled (basic only)
X9	= On or Off status Emulation, muting, or power supply = Executive mode	0 = off or disabled 1 = on or enabled 0 = enable (basic and admin) 1 = disabled front panel 2 = enabled (basic only)
X10	= Output rate (nnnn.nn)	- - - = bypass mode 0000 = no connection (rate mismatch) nnnn = actual rate
X11	= Global or plane preset number	0 = no mute 1 = video 2 = audio 3 = video and audio
X12	= Input Connection Status	0 = Connected 1 = disconnected
X13	= Delay	0 – 10 (0 – 5 seconds in 0.5 second increments)
X14	= Video/Audio mute	0 = no mute 1 = video 2 = audio 3 = video and audio
X15	= Sync frequency	xxx.xx (in Hz or kHz)
X16	= HDCP compliance	0 = no source connected 1 = source is HDCP compliant 2 = source is not HDCP compliant

X18	= Reclocker rates for SDI/HD-SDI boards	00 = auto detect (default) 01 = bypass reclocker
X19	= Signal status	0 = no signal at the input 1 = signal at the input (H) 2 = signal at the input (V) 3 = signal at the input (HV/receive link presence for fiber boards)
X20	= Output connection status	0 = no active connection on A or B 1 = first (A) port connected and second (B) port not connected 2 = first (A) port not connected and second (B) port connected 3 = active connection on both A and B
X21	= Version number	x.xx.xxxx (the first 3 numbers is the version number and the last 4 is the build number)
X22	= Plane addresses	00 – 15 = for 16 planes 90 – 99 = for virtual planes (10 planes)
X24	= Voltage	Positive or negative voltage magnitude
X25	= Temperature	In Degrees Fahrenheit
X26	= Fan speed	In RPM
X29	= Create virtual plane address	90 – 99 = 10 planes
X30	= Slot number	1 – 4 for 2U units 1 – 6 for 3U units 1 – 8 for 4U units 1 – 10 for 5U units 00 = e-mail F & P 1 – 10 = e-mail I

X31

= Slot information

XYZ

X = board type (B – Y)

YZ = board size (00 – 15)

(X)	Board Type	(X)	Board Type
B	Video	N	DVI Pro
C	S-video	O	HDMI
D	S-video	P	FOMX 1616
E	Wideband	Q	FOMX 88
F	S-video DIN	R	RESERVED
G	VGA	S	RESERVED
H	VGA	T	RESERVED
I	Audio analog	U	USB
J	SDI/HDS DI	V	RESERVED
K	Sync	W	DVI (2 data blocks)
L	DVI	X	No board installed
M	DVI	Y	DVI (2 data blocks)

(YZ) Reference #	Board Size	Note
15	16x16	
09	8x4x2	For S-video BNC
08	8x8x2	For sync and S-video
07	8x8	
06	8x4	
05	4x8	
04	4x4	
00	No board installed or slot covered by multi slot board	Refer to next slot for size of board.

X32

= EDID reference file for DDC data

15 = default (1024x768 at 60 Hz) for DVI

32 = default (720p) for DVI Pro and HDMI boards

1 – 8 = stored from connected monitors as reference

9 – 36 = fixed factory rates

37 – 40 = user assigned

X33

= Primary power supply

0 = not installed

1 = OK

2 = failed

X34

= Secondary (redundant) power supply

0 = not installed

1 = OK

2 = failed

EDID Minder Table — DDC Source Selection						DVI-Pro and HDMI	
SIS value X32	Resolution	Refresh (Hz)	SIS value X32	Resolution	Refresh (Hz)	Resolution	Refresh (Hz)
1	Output 1		21	1280x1024	60		
2	Output 2		22	1280x1024	75		
3	Output 3		23	1365x768	60		
4	Output 4		24	1365x768	75		
5	Output 5		25	1366x768	60		
6	Output 6		26	1366x768	75		
7	Output 7		27	1400x1050	60		
8	Output 8		28	1600x1200	60		
9	640x480	60	29	480p	60	480p 2 channel audio	60
10	640x480	75	30	576p	50	576p 2 channel audio	60
11	800x600	60	31	720p	50	720p 2 channel audio	50
12	800x600	75	32	720p (default) DVI-Pro/HDMI	60	720p (default) 2 channel audio	60
13	852x480	60	33	1080i	50	1080p multi channel audio	60
14	852x480	75	34	1080i	60	1080i 2 channel audio	60
15	1024x768 (default) DVI	60	35	1080p	50	1080p 2 channel audio	50
16	1024x768	75	36	1080p	60	1080p 2 channel audio	60
17	1024x852	60	37	User assigned			
18	1024x852	75	38	User assigned			
19	1280x768	60	39	User assigned			
20	1280x768	75	40	User assigned			

NOTES: The DDC source resolution and refresh rates for DVI-Pro and HDMI are the same for lines 1-28, 30-31, 35, and 37-40, but differ for lines 29, 32-34, and 36.

Multi channel audio consists of:

PCM	2 channel audio (stereo)	DTS	8 channel audio
AC-3	6 channel audio	E-AC-3	8 channel audio
PCM	8 channel audio	DTS-HD	8 channel audio
AC-3	8 channel audio	MLP	8 channel audio

2-channel audio is:

PCM	2 channel audio (stereo)
-----	--------------------------

X60 = EDID file data block

128 – 256 bytes of binary data for DVI (256 bytes depending which DVI board is installed), or 256 bytes for DVI-Pro and HDMI

NOTE: EDID data block size is dependent on which DVI board is installed.

Command/Response Table for SIS Commands

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Output Switching by Plane			
NOTES: <ul style="list-style-type: none"> The & tie command for RGBHV and the % tie command for video can be used interchangeably. The ! tie command can be used for switching both video signals and audio signals with the same plane address. The & tie command for RGB and the % tie command for video can be used interchangeably. The & read tie command for RGB and the % read tie command for video can be used interchangeably. Commands can be entered back-to-back in a string with no spaces. For example: 1*1*1&001*002&001*003*003&001... The SMX supports 1-, 2-, and 3-digit numeric entries (1*1!, 01*02*02&, or 001*003*003%). 			
Tie input to an output (RGBHV)	X22*X2*X3&	X22 Out X3•In X2•RGB←	Tie input X2 to output X3 on plane X22 for RGB signals.
Tie input to an output (Video)	X22*X2*X3%	X22 Out X3•In X2•Vid←	Tie input X2 to output X3 on plane X22 for Video signals.
Tie input to an output (Audio)	X22*X2*X3\$	X22 Out X3•In X2•Aud←	Tie input X2 to output X3 on plane X22 for audio signals.
Tie input to an output (All)	X22*X2*X3!	X22 Out X3•In X2•All←	Tie input X2 to output X3 on plane X22 for all signals.
Tie input to all (RGBHV)	X22*X2*&	X22 In X2•RGB←	Tie input X2 to all outputs on plane X22 for RGB signals.
Tie input to all (video)	X22*X2*%	X22 In X2•Vid←	Tie input X2 to all outputs on plane X22 for video signals.
Tie input to all (audio)	X22*X2*\$	X22 In X2•Aud←	Tie input X2 to all outputs on plane X22 for audio signals.
Tie input to all (audio and video)	X22*X2*!	X22 In X2•All←	Tie input X2 to all outputs on plane X22 all signals.
Quick Multiple Tie			
Make multiple ties	[Esc]+Q X22*X2*X3! ...X22*X2*X3\$←	Qik←	Make multiple ties with one command entry.
Example:	[Esc]+Q01*3*4!01*3... *5%01*3*6\$←	Qik←	Tie plane 01 input 3 audio and video signals to outputs 4 (audio and video), 5 (video only), and 6 (audio only).
NOTE: This command activates all I/O switches simultaneously.			
NOTES: <div> <div> X2 = Input number X3 = Output number X22 = Plane number </div> <div> 01 - <maximum number of inputs> 00 = untied 01 - <maximum number of outputs> 00 - 15 = plane address 90 - 99 = virtual plane </div> </div>			

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
View Ties			
NOTE: If the view follow-all tie command (!) is used for an output with a break-away tie, the SMX will respond with an error message (E14).			
View RGBHV output tie	X22 * X3 &	X2 ↵ X22 Out X3 •In X2 •RGB↵	View RGBHV input tied to output X3 on plane X22 . Verbose mode 2 or 3
View video output tie	X22 * X3 %	X2 ↵ X22 Out X3 •In X2 •Vid↵	View video input tied to output X3 on plane X22 . Verbose mode 2 or 3
View audio output tie	X22 * X3 \$	X2 ↵ X22 Out X3 •In X2 •Aud↵	View audio input tied to output X3 on plane X22 . Verbose mode 2 or 3
RGB/Video Mute by Plane			
RGB/video mute	X22 * X3 *1B	X22 Vmt X3 *1↵	Mute RGB/video output X3 .
RGB/video unmute	X22 * X3 *ØB	X22 Vmt X3 *Ø↵	Unmute RGB/video for X3 .
Read RGB/video mute	X22 * X3 B	X9 ↵	Read RGB/video output X3 .
RGB/video mute entire plane	X22 *1*B	X22 VmtØØ*1↵	Mute RGB/video plane X22 .
RGB/video unmute entire plane	X22 *Ø*B	X22 VmtØØ*Ø↵	Unmute RGB/video plane X22 .
Audio Mute by Plane			
Audio mute	X22 * X3 *1Z	X22 Amt X3 *1↵	Mute audio output X3 .
Audio unmute	X22 * X3 *ØZ	X22 Amt X3 *Ø↵	Unmute audio for X3 .
Read audio mute	X22 * X3 Z	X9 ↵	Read audio output X3 .
Audio mute entire plane	X22 *1*Z	X22 AmtØØ*1↵	Mute all audio on plane X22 .
Audio unmute entire plane	X22 *Ø*Z	X22 AmtØØ*Ø↵	Unmute all audio on plane X22 .
View Mute			
View output mutes (entire plane)	Esc X22 VM↵	X14 ¹ X14 ² ... X14 ⁿ ↵ Mut X22 * X14 ¹ X14 ² ... X14 ⁿ ↵	View output mute for plane X22 . Verbose mode 2 or 3
RGB Delay (Triple Action Switching) - for VGA / RGBHV Only			
Set RGB Delay (by plane)	Esc X22 * X3 * X13 D↵	X22 Out X3 •Dly X13 ↵	Set the RGB Delay of output X3 .
Read RGB Delay	Esc X22 * X3 D↵	X13 ↵	
NOTES: X2 = Input number X3 = Output number X9 = Mute status X13 = RGB delay interval X14 = Video/Audio mute status X22 = Plane number			
Ø1 – <maximum number of inputs> Ø1 – <maximum number of outputs> Ø = off 1 = on 1Ø = maximum (in 0.5 second increments) Ø = no mutes 1 = video mute 2 = audio 3 = video and audio mute ØØ - 15 (16 planes)			

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Global Presets (All Planes)			
Save current ties as a global preset	[X11] ,	Spr [X11] ↵	Save the current set of ties as global preset [X11] .
Recall a global preset	[X11] .	Rpr [X11] ↵	Recall global preset [X11] , and make it the current configuration.
NOTE: Attempting to recall an unsaved preset will result in a E11 error code.			
Plane Presets			
Save current ties as a plane preset	[X22]*[X11]*Ø ,	[X22] Spr [X11] ↵	Save the current set of ties as plane preset [X11] .
Recall a plane preset	[X22]*[X11]*Ø .	[X22] Rpr [X11] ↵	Recall plane preset [X11] as the current configuration.
View Presets (Ties)			
NOTE: The G and P commands are case sensitive.			
View current video configuration/plane	[Esc]G[X22]*Ø*[X3]*1VC ↵ Vgp [X22]*ØØ•Out[X3]•[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Vid ↵	[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Vid ↵	View video configuration. Verbose mode 2 or 3
View current audio configuration/plane	[Esc]G[X22]*Ø*[X3]*2VC ↵ Vgp [X22]*ØØ•Out[X3]•[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Aud ↵	[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Aud ↵	View audio configuration. Verbose mode 2 or 3
View global presets (video)	[Esc]G[X22]*[X11]*[X3]*1VC ↵ Vgp [X22]*[X11]•Out[X3]•[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Vid ↵	[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Vid ↵	View video configuration. Verbose mode 2 or 3
View global presets (audio)	[Esc]G[X22]*[X11]*[X3]*2VC ↵ Vgp [X22]*[X11]•Out[X3]•[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Aud ↵	[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Aud ↵	View audio configuration. Verbose mode 2 or 3
View plane presets (video)	[Esc]P[X22]*[X11]*[X3]*1VC ↵ Vpp [X22]*[X11]•Out[X3]•[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Vid ↵	[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Vid ↵	View video configuration. Verbose mode 2 or 3
View plane presets (audio)	[Esc]P[X22]*[X11]*[X3]*2VC ↵ Vpp [X22]*[X11]•Out[X3]•[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Aud ↵	[X2]¹•[X2]²•[X2]³•[X2]⁴... [X2]¹⁶•Aud ↵	View audio configuration. Verbose mode 2 or 3
NOTES: <ul style="list-style-type: none"> • If a preset is unassigned, then name displayed is [unassigned]. • If a global preset is saved but not yet named, then default name is "Preset [X11]," ([X11] = preset number). • Viewing global presets show the ties for the selected plane. • Viewing plane presets lists only the configuration of that particular plane. • When viewing outputs, only outputs higher than the one designated display. 			
Virtual (Multi Plane) Definition			
Write virtual plane address	[Esc][X29],[X22]¹*[X22]²*... [X22]ⁿMP ↵	Mpv [X29],[X22]¹, [X22]²... [X22]ⁿ ↵	Write virtual plane address.
Read Virtual plane address	[Esc][X29]MP ↵	[X22]¹, [X22]²... [X22]ⁿ ↵	Read virtual plane address.
NOTES: <div> <div> [X2] = Input number [X3] = Output number [X11] = Preset number [X22] = Plane number [X29] = Virtual plane number </div> <div> Ø1 - <maximum number of inputs> Ø1 - <maximum number of outputs> Ø1 - 32 = global presets 1 - 1Ø = plane presets ØØ - 15 = 16 planes 9Ø - 99 = 10 planes </div> </div>			

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description												
Front Panel Lockout (Executive Mode)															
Lock front panel (advanced functions)	2X	Exe2↵	Enable lock mode 2.												
Lock front panel	1X	Exe1↵	Enable lock mode 1.												
Unlock front panel	ØX	ExeØ↵	Disable lock mode.												
View front panel lock	X	X9↵	Show lock mode status.												
NOTE: For full lock mode details, see Setting the Front Panel Locks (Executive Modes) on page 25.															
Information Requests															
NOTE: Firmware version/part number/information Primary BME only.															
Query firmware version	Q	X21↵													
Example:	Q	1.14↵ VerØ1*X21↵	The firmware version is 1.14. Verbose mode 2 or 3												
Query firmware and build version	*Q	X21↵ BldX21↵	Verbose mode 2 or 3												
Query kernel firmware and build version	**Q	X21↵ LibX21↵	Verbose mode 2 or 3												
Query verbose version information	ØQ	Sum of responses from 2Q-3Q-4Q↵ VerØØ* sum of responses from 2Q-3Q-4Q↵ verbose response													
NOTE: The firmware that is currently running is marked by an asterisk (*). A question mark (? . ??) indicates that only factory firmware is loaded. A caret (^) indicates the firmware that should be running, but a Mode 1 reset was executed and the default factory version is loaded. An exclamation point (!) indicates corrupted firmware.															
Example ØQ Response: <table> <tr> <td></td> <td>Description</td> <td>* indicates the version running</td> <td>Upload date and time</td> </tr> <tr> <td>1.23 - Ø.14(Ø.2Ø-SMX Series - Wed, 04 Jan 2006 23:11:29 GMT) - 1.ØØ*(Ø.24-SMX Series - Thu, 20 Apr 2007 20:02:35 GMT)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Ethernet protocol firmware</td> <td>SMX firmware version</td> <td></td> <td>Updated firmware version</td> </tr> </table>					Description	* indicates the version running	Upload date and time	1.23 - Ø.14(Ø.2Ø-SMX Series - Wed, 04 Jan 2006 23:11:29 GMT) - 1.ØØ*(Ø.24-SMX Series - Thu, 20 Apr 2007 20:02:35 GMT)				Ethernet protocol firmware	SMX firmware version		Updated firmware version
	Description	* indicates the version running	Upload date and time												
1.23 - Ø.14(Ø.2Ø-SMX Series - Wed, 04 Jan 2006 23:11:29 GMT) - 1.ØØ*(Ø.24-SMX Series - Thu, 20 Apr 2007 20:02:35 GMT)															
Ethernet protocol firmware	SMX firmware version		Updated firmware version												
Query firmware version	1Q	X21↵ VerØ1*X21↵	Verbose mode 2 or 3												
Query bootstrap version	2Q	X21↵ VerØ2*X21↵	Verbose mode 2 or 3												
Query factory firmware version	3Q	X21↵ (plus web ver.-desc-upload date/time) VerØ3*X21↵ (plus ver.-desc-upload date/time)↵	Verbose mode 2 or 3												
Query updated firmware version	4Q	X21↵ (plus web ver.-desc-upload date/time)↵ VerØ4*X21↵ (plus web ver.-desc-upload date/time)↵	Verbose mode 2 or 3												
NOTE: The 3Q and 4Q responses indicate the web version, a brief description (model used on), and the date the last version was uploaded. For example, a typical 4Q response is; [1.14*(1.77-SMX Series -Wed, 01 Apr 2011 18:35:43 GMT)], indicating loaded firmware version is 1.14, web version is 1.77 for the SMX, uploaded Wednesday, April 1st 2011 at 6:35 pm GMT).															
NOTES: X9 = Lock mode status: Ø = disabled, 1 = enabled, 2 = enabled (basic only) X21 = Version number x.x x															

Command	ASCII Command (Host to switcher)	Response (Switcher to host)	Additional Description
Query system status	S	$\overline{X24} \bullet \overline{X24} \bullet \overline{X24} \bullet \overline{X25} \bullet \overline{X26} \bullet \overline{X26} \bullet \overline{X33} \bullet \overline{X34} \leftarrow$	
Query specific system status	nS	$\overline{X24}$ or $\overline{X25}$ or $\overline{X26}$ or $\overline{X33} \leftarrow$ Stsn* $\overline{X24}$ or $\overline{X25}$ or $\overline{X26}$ or $\overline{X33} \leftarrow$	Verbose mode 2 or 3
Example:	S	Sts0* 3.31 4.98 24.22 +100.40 03305 03308 1 0 3.31 and 4.98 are power supply voltages; 24.22 is fan voltage, 100.40 (degrees F) is the temperature, 03305 is fan 1 rpm, 03308 is fan 2 rpm, 1 is primary power supply (OK).	
Query switcher information (general) per plane (16 actual and 10 virtual) plus board configuration	I	V $\overline{X2}^0$ X $\overline{X3}^0$ A $\overline{X2}^0$ X $\overline{X3}^0$... V $\overline{X2}^{15}$ X $\overline{X3}^{15}$ A $\overline{X2}^{15}$ X $\overline{X3}^{15}$... V $\overline{X2}^{25}$ X $\overline{X3}^{25}$ A $\overline{X2}^{25}$ X $\overline{X3}^{25} \leftarrow$	
Example:		V16x16A16x16•V--X--A--X--•V--X--A--X--•V--X--A--X--•... ..•V--X--A--X-- -X--•... ..•V--X--A--X-- \leftarrow	
NOTE: The I response gives 26 parameters, the first 16 (V_x_A_x_) is plane information (planes 0-15), and the next are virtual planes 1-10 (90-99).			
Query model name	1I	Switcher description (short) \leftarrow Inf01*Switcher description (short) \leftarrow Inf01*SMX \leftarrow	Verbose mode 2 or 3
Example:			
Query model description	2I	Switcher description (long) \leftarrow Inf02*Switcher description (long) \leftarrow Inf02*System Multi Matrix \leftarrow	Verbose mode 2 or 3
Example:			
Query system-memory usage	3I	# of Bytes used out of # KBytes \leftarrow Inf03*# of Bytes used out of # KBytes	Verbose mode 2 or 3
Query user-memory usage	4I	# of Bytes used out of # KBytes \leftarrow Inf04*# of Bytes used out of # KBytes	Verbose mode 2 or 3
Query plane address per slot	[Esc] STAT \leftarrow	$\overline{X22}^{(slot\ 1)} \bullet \overline{X22}^{(slot\ 2)} \bullet \dots \overline{X22}^{(slot\ 6/8/10)} \leftarrow$ Stat $\overline{X22}^{(slot\ 1)} \bullet \overline{X22}^{(slot\ 2)} \bullet \dots \overline{X22}^{(slot\ 6/8/10)} \leftarrow$	Verbose mode 2 and 3
Example:	Stat*	5U frame, 10 slots Slot 1 2 3 4 5 6 7 8 9 10 00•01•--•02•--•--•03•--•03•03 \leftarrow Slot 1 00 the board address installed in slot 1 is plane 00 Slot 2 01 the board address installed in slot 2 is plane 01 Slot 3 -- No board installed	

NOTES: $\overline{X2}$ = Input number	01 - <maximum number of inputs> 00 = untied
$\overline{X3}$ = Output number	01 - <maximum number of outputs>
$\overline{X22}$ = Plane number	00 - 15 90 - 99 = virtual plane + or – voltage
$\overline{X24}$ = Voltage	RPM
$\overline{X25}$ = Temperature	0 = not installed 1 = OK 2 = failed
$\overline{X26}$ = Fan speed	0 = not installed 1 = OK 2 = failed
$\overline{X33}$ = Primary power supply	
$\overline{X34}$ = Secondary (redundant) power supply	

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Query part number and slot information	N	60-xxx-yy	
	*N	60-xxx-yy.X31n ¹ X31n ² X31n ³ ...X31n ^{6/8/10} ↵ Pno 60-xxx-yy.X31n ¹ X31n ² X31n ³ ...X31n ^{6/8/10} ↵ Verbose mode 2 or 3	
Example:	*N	Pno60-857-01.L04J07G00G00G00G15D00D15C00C15 Where X31n ^x = XYZ; X = type of board (B-T & X), YZ = board size (00-15) and nx is the number of the slot the board is installed in.	

NOTE: Left table gives X value. Right table gives YZ value.

n1 = Slot 1 L04 DVI board (L) 4x4 configuration (04) - 1 slot board
n2 = Slot 2 J07 HD-SDI bard (J) 8x8 configuration (07) - 1 slot board
n3 = Slot 3 G00 Slot 3 is covered by VGA board (G) no board (0)
n4 = Slot 4 G00 Slot 4 is covered by VGA board (G) no board (0)
n5 = Slot 5 G00 Slot 5 is covered by VGA board (G) no board (0)
n6 = Slot 6 G15 VGA board (G) 1616 configuration (15) - 4 slots board
n7 = Slot 7 D00 Slot 7 is covered by S-video BNC board top (D) no board (0)
n8 = Slot 8 D15 S-video BNC top board (D) 1616 configuration (15) - 2 slots (top) of 4
n9 = Slot 9 C00 Slot 9 is covered by S-video BNC board bottom (C) no board (0)
n10 = Slot 10 C15 S-video BNC top board (C) 1616 configuration (15) - 2 slots (bottom) of 4

A slot response can show either no board installed (X00), or the slot is covered by a multi slot board as shown in the example above; slots 3, 4, and 5, (G00) are covered by the 1616 VGA board in slot 6.

(X)	Board Type	(X)	Board Type
B	Composite BNC	N	DVI Pro
C	S-video BNC	O	HDMI
D	S-video BNC 1616	P	FOMX 1616
E	Wideband	Q	FOMX 88
F	S-video DIN	R	RESERVED
G	VGA 1616	S	RESERVED
H	VGA 88/84	T	RESERVED
I	Audio analog	U	USB
J	SDI/HDSDI	V	RESERVED
K	Sync	W	DVI (2 data blocks)
L	DVI	X	No board installed
M	DVI	Y	DVI (2 data blocks)

Reference # (YZ)	Board Size	Note
15	16x16	
09	8x4x2	For S-video BNC
08	8x8x2	For sync and S-video
07	8x8	
06	8x4	
05	4x8	
04	4x4	
00	No board installed or slot covered by multi slot board	Refer to next slot for size of board

NOTE: X31 = board type and board size (XYZ)

X = Type of board (B - Y)
YZ = Board size (00 - 15)

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
EDID Commands by Slots			
Assign EDID data to input	[Esc] A[X30]*[X1]*[X32]EDID←	[X30]EdidA[X1]*[X32]↵	
Assign EDID data to all inputs	[Esc] A[X30]*[X32]*EDID←	[X30]EdidA00*[X32]↵	
Save output 1 EDID data	[Esc] S[X30]*[X32]EDID←	[X30]EdidS[X32]↵	Applies only when [X32] = 37 to 40.
View EDID data assignment	[Esc] A[X30]*[X1]EDID←	[X32]↵ [X30]EdidA[X1]*[X32]↵	Verbose mode 2 or 3
Export EDID file data	[Esc] E[X30]*[X32]EDID←	[X60]↵ [X30]EdidE[X32]*[X60]↵	Verbose mode 2 or 3
Import EDID file data	[Esc] I[X30]*[X32]EDID←[X60]	[X30]EdidI[X32]↵	[X32] = 37 to 40

EDID Minder Table — DDC Source Selection						DVI-Pro/HDMI*	
SIS Value [X32]	Resolution	Refresh (Hz)	SIS Value [X32]	Resolution	Refresh (Hz)	Resolution	Refresh (Hz)
1	Output 1		21	1280x1024	60		
2	Output 2		22	1280x1024	75		
3	Output 3		23	1365x768	60		
4	Output 4		24	1365x768	75		
5	Output 5		25	1366x768	60		
6	Output 6		26	1366x768	75		
7	Output 7		27	1400x1050	60		
8	Output 8		28	1600x1200	60		
9	640x480	60	29	480p	60	480p 2 ch audio	60
10	640x480	75	30	576p	50	576p 2 ch audio	60
11	800x600	60	31	720p	50	720p 2 ch audio	50
12	800x600	75	32	720 (default) DVI-Pro/HDMI	60	720p (default) 2 ch audio	60
13	852x480	60	33	1080i	50	1080i Multi ch audio	60
14	852x480	75	34	1080i	60	1080i 2 ch audio	60
15	1024x768 (default) DVI	60	35	1080p	50	1080p 2 ch audio	50
16	1024x768	75	36	1080p	60	1080p 2 ch audio	60
17	1024x852	60	37	User assigned			
18	1024x852	75	38	User assigned			
19	1280x768	60	39	User assigned			
20	1280x768	75	40	User assigned			

NOTES: For DVI-Pro/HDMI EDID data, resolutions 1-28, 30-31, 35, and 37-40, are the same. Resolutions 29, 32-34, and 36 differ. For DVI-Pro/HDMI channel definitions (see [page 41](#)).

[X1] = Input number

[X30] = Slot address

[X32] = EDID reference file for DDC data

[X60] = EDID file data block

01 - <maximum number of inputs>

01 - 10

15 (DVI) or 32 (DVI-Pro) is default

0 = automatic

1 - 8 = stored from connected EDID monitors (reference)

9 - 36 = factory fixed rates

37 - 40 = user definable

128 or 256 bytes of binary data for DVI (depending on which DVI board is installed or 256 bytes for DVI-Pro/HDMI)

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Commands Specific to SMX SDI/HD-SDI Boards			
Output Re-clocking Per Slot			
Set output reclocker per slot	$\text{X30}^* \text{X3}^* \text{X18} =$	Rte $\text{X30}^* \text{X3}^* \text{X18} \leftarrow$	
Read reclocker	$\text{X30}^* \text{X3} =$	$\text{X18} \leftarrow$	
List DSVP (Digital Sync Validation Processing)			
DSVP for VGA and RGBHV			
List individual sync (DVSP)	$\text{X30}^* \text{X1} \text{LS}$	$\text{X15}^{\text{H}}, \text{X15}^{\text{V}} \leftarrow$ $\text{X30} \text{FRQ} \text{X1}^1, \text{X15}^{\text{H}}, \text{X15}^{\text{V}} \leftarrow$	Listed as Horizontal, Vertical. Verbose mode 2 or 3
NOTE: Unit responds 0000.00, 0000.00 if no connection or an error is found.			
List all input sync (DVSP)	$\text{X30}^* \emptyset \text{LS}$	$\text{X19}^1 \text{X19}^2 \dots \text{X19}^n \leftarrow$ $\text{X30} \text{FRQ} \emptyset^* \text{X19}^1 \text{X19}^2 \dots \text{X19}^n \leftarrow$	Verbose mode 2 or 3
DSVP (Signal Present) for Composite/S-video/DVI/DVI-Pro/HDMI Boards			
List all input sync (DVSP)	$\text{X30}^* \emptyset \text{LS}$	$\text{X19}^1 \text{X19}^2 \dots \text{X19}^n \leftarrow$ $\text{X30} \text{FRQ} \emptyset^* \text{X19}^1 \text{X19}^2 \dots \text{X19}^n \leftarrow$	Verbose mode 2 or 3
NOTE: List individual signal present per slot is not available on this board. Unit responds with error E14.			
DSVP (Signal Present and Rate/Reclocker) for SDI/HD-SDI Boards			
List individual sync (DVSP)/slot	$\text{X30}^* \text{X3} \text{LS}$	$\text{X10} \leftarrow$ $\text{X30} \text{FRQ} \text{X3}^* \text{X10} \leftarrow$	Verbose mode 2 or 3
NOTE: Unit responds 0000 if no connection, no ties, or an error is found.			
List all sync (DVSP)/slot	$\text{X30}^* \emptyset \text{LS}$	$\text{X19}^1 \text{X19}^2 \dots \text{X19}^n \leftarrow$ $\text{X30} \text{FRQ} \emptyset^* \text{X19}^1 \text{X19}^2 \dots \text{X19}^n \leftarrow$	Verbose mode 2 or 3
DSVP (Link Present) for Fiber Optic Boards			
List all input (DVSP)	$\text{X30}^* \emptyset \text{LS}$	$\text{X19}^1 \text{X19}^2 \dots \text{X19}^n \leftarrow$ $\text{X30} \text{FRQ} \emptyset^* \text{X19}^1 \text{X19}^2 \dots \text{X19}^n \leftarrow$	Verbose mode 2 or 3
NOTE: List individual signal present per slot is not available on this board. Unit responds with error E14.			
Fiber Optic Board Status			
View Fiber transceiver module installed	$\emptyset^* \text{X30} \text{I}$	$\text{X8}^1 \text{X8}^2 \dots \text{X8}^n \leftarrow$ Inf $\text{X30}^* \text{X8}^1 \text{X8}^2 \dots \text{X8}^n \leftarrow$	Verbose mode 2 or 3
NOTES: <div> <div> X1 = Input number X3 = Output Number X8 = Fiber optic transceiver module X10 = Output rate X15 = Sync frequency X18 = Reclocker rates for SDI/HD-SDI board X19 = Signal status where X30 = Slot address </div> <div> $\emptyset 1$ - <maximum number of inputs> $\emptyset 1$ - <maximum number of outputs> \emptyset = no module installed 1 = multimode module 2 = singlemode module - - - = bypass mode 0000 = no connection (rate mismatch) nnnn = actual rate xxx.xx in Hz or kHz 00 = autodetect (default) 01 = bypass the reclocker 0 = no signal at input 1 = signal at input (H sync) 2 = signal at input (V sync) 3 = signal at input (H and V sync) or receive link presence $\emptyset 1 - 10$ </div> </div>			

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
HDCP Detect			
View input HDCP	[Esc] I [X30] * [X1] HDCP ←	[X8] ← [X30] HdcpI [X1] * [X8] ←	View HDCP of input [X1] . Verbose mode 2 or 3
View output HDCP	[Esc] O [X30] * [X3] HDCP ←	[X8] ← [X30] HdcpO [X3] * [X8] ←	View HDCP of output [X3] . Verbose mode 2 or 3
View all inputs HDCP	[Esc] I [X30] *HDCP ←	[X8] ¹ [X8] ² [X8] ³ ... [X8] ⁿ ← [X30] HdcpI 000* [X8] ¹ [X8] ² ... [X8] ⁿ ←	View HDCP of all inputs in slot [X30] . Verbose mode 2 or 3
View all outputs HDCP	[Esc] O [X30] *HDCP ←	[X8] ¹ [X8] ² ... [X8] ⁿ ← [X30] HdcpO 000* [X8] ¹ [X8] ² ... [X8] ⁿ ←	View HDCP of all inputs in slot [X30] . Verbose mode 2 or 3
Setting Input Audio Gain and Attenuation by Plane			
NOTE: The G and g commands are case sensitive.			
Gain (+dB)	[X22] * [X1] * [X5] G	[X22] In [X1] •Aud [X4] ←	
Attenuation	[X22] * [X1] * [X6] g	[X22] In [X1] •Aud [X4] ←	
Increment	[X22] * [X1] +G	[X22] In [X1] •Aud [X4] ←	
Decrement	[X22] * [X1] -G	[X22] In [X1] •Aud [X4] ←	
Setting Output Audio Volume by Plane			
Increment	[X22] * [X3] +V	[X22] Out [X3] •Vol [X7] ←	
Decrement	[X22] * [X3] -V	[X22] Out [X3] •Vol [X7] ←	
Output level	[X22] * [X3] * [X7] V	[X22] Out [X3] •Vol [X7] ←	
View Audio Levels			
Audio gain for input	[X22] * [X1] G	[X4] ←	
Audio volume for output	[X22] * [X3] V	[X7] ←	
Names			
NOTE: Names may have up to 12 characters, but the following characters are invalid or not recommended for names: - , ' [ ] { } ; | \ ?			
Write global preset name	[Esc] [X11] ,nameNG ←	Nmg [X11] ,name ←	Assign name to preset [X11] .
Example:	[Esc] 1,Security1NG ←	Nmg01,Security1 ←	Name global preset 1 "Security1."
Read global preset	[Esc] [X11] NG ←	name ←	
Example:	[Esc] 2NG ←	Security1 ←	
Write plane preset	[Esc] [X22] * [X11] ,nameNG ←	[X22] Nmg [X11] ,name ←	
Read plane preset	[Esc] [X22] * [X11] NG ←	name ←	
NOTES:			
[X1] = Input number		01 - <maximum number of inputs>	
[X3] = Output number		01 - <maximum number of outputs>	
[X4] = Numeric dB value		-18 though +24 dB (43 steps of gain or attenuation)	
[X5] = Audio gain		0 dB through 24 dB)	
[X7] = Volume adjustment		0 - 64 (default = 64 [0 dB])	
[X11] = Global/plane preset		0 = current ties for system in view	
		1 - 32 max global, 1 - 10 max plane	
[X16] = HDCP compliance		0 = no source/output connected	
		1 = source/output connected is HDCP compliant	
		2 = Source/output connected is not HDCP compliant	
[X22] = Plane address		00 to 15 (16 planes)	
[X30] = Slot address		1 - 10	

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Write input name (per plane)	Esc X22 * X1 ,nameNI ←	X22 Nmi X1 ,name ←	Assign a name to input X1 .
Read input name	Esc X22 * X1 NI ←	name ←	
Write output name (per plane)	Esc X22 * X3 ,nameNO ←	X22 Nmo X3 ,name ←	Assign a name to output X3 .
Read output name	Esc X22 * X3 NO ←	name ←	
NOTES: <ul style="list-style-type: none"> • If a preset (global or plane) is unassigned, its name is displayed [unassigned]. • If a global preset is saved but not named, its default name is Preset X11. • If a plane preset is saved but not named, its default name is PlnX22•PreX11. • If you attempt to name or recall a preset that is not saved, or is unassigned, the unit responds with the error message E11. • Putting a space in the name field sets the I/O and presets (global & plane) back to default. 			
Reset to Factory Defaults (Zap Commands)			
Reset global presets and names	Esc ZG ←	Zpg ←	Clear all global presets and their names.
Reset individual global presets	Esc X11 ZG ←	Zpg X11 ←	Clear global preset X11 .
Reset individual plane presets	Esc X22 * X11 ZG ←	X22 Zpg X11 ←	Clear plane preset X11 .
Reset All RGB Delay to 0 seconds	Esc ZD ←	Zpd ←	Reset RGB Delay to zero.
Reset RGB Delay entire plane	Esc X22 ZD ←	X22 Zpd ←	Reset RGB Delay to zero.
Reset all audio gains to 0 dB	Esc ZA ←	Zpa ←	Reset all audio gains to zero.
Reset audio gains to 0 dB for entire plane	Esc X22 ZA ←	X22 Zpa ←	Reset all audio gains to zero.
Reset all audio volume to 100%	Esc ZV ←	Zpv ←	Reset all volume to 100%.
Reset all audio volume to 100% for entire plane	Esc X22 ZV ←	X22 Zpv ←	Reset all volume to 100%.
Unmute RGB/Audio (all mutes)	Esc ZZ ←	Zpz ←	
Unmute RGB/Audio (per plane)	Esc X22 ZZ ←	X22 Zpz ←	
Reset switcher	Esc ZXXX ←	Zpx ←	Clear all ties and presets and reset the SMX to factory defaults.
Reset flash memory	Esc ZFFF ←	Zpf ←	Reset flash memory (reset user-supplied files).
Absolute system reset	Esc ZQQQ ←	Zpq ←	Reset IP address to 192.168.254.254 and subnet mask to 255.255.0.0.
Reset all device settings and delete files	Esc ZY ←	Zpy ←	Reset device and delete all files.
NOTE: Esc ZY reset excludes IP settings (IP address, subnet mask, gateway address, unit name, DHCP settings and port mapping [Telnet, web, or direct access]) in order to preserve communications with the device. This reset is recommended after a firmware update.			
NOTES: <div> <div> X1 = Input number X3 = Output number X11 = Global or plane preset X22 = Plane address </div> <div> 01 - <maximum number of inputs> 01 - <maximum number of outputs> 1 - 32 = global 1 - 10 = plane 00 - 15 = 16 planes 90 - 99 = virtual planes (10 planes) </div> </div>			

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Commands Specific to SMX USB Boards			
Port Emulation for Outputs			
Set port emulation for all outputs	[Esc] E [X30] * [X9] *USBC ←	[X30] UsbcE0* [X9] ←	Enable or disable port emulation for all outputs.
Set port emulation for output pairs	[Esc] E [X30] * [X3] * [X9] USBC ←	[X30] UsbcE [X3] * [X9] ←	Enable or disable port emulation for output [X3] .
View port emulation status for outputs	[Esc] E [X30] * [X3] USBC ←	[X9] ← [X30] UsbcE [X3] * [X9] ←	Verbose mode 2 and 3
View port emulation status for all outputs	[Esc] E [X30] *USBC ←	[X9] ¹ [X9] ² [X9] ³ ... [X9] ⁿ ← [X30] UsbcE* [X9] ¹ [X9] ² ... [X9] ⁿ ←	Verbose mode 2 and 3
Signal Status			
View input signal status	[Esc] I [X30] * [X1] USBC ←	[X12] ← [X30] UsbcI [X1] * [X12] ←	Verbose mode 2 and 3
View all input signal status	[Esc] I [X30] *USBC ←	[X12] ¹ [X12] ² [X12] ³ ... [X12] ⁿ ← [X30] UsbcI* [X12] ¹ [X12] ² [X12] ³ ... [X12] ⁿ ←	Verbose mode 2 and 3
View output signal status	[Esc] O [X30] * [X3] USBC ←	[X20] ← [X30] UsbcO [X3] * [X20] ←	Verbose mode 2 and 3
View all output signal status	[Esc] O [X30] *USBC ←	[X20] ¹ [X20] ² [X20] ³ ... [X20] ⁿ ← [X30] UsbcO* [X20] ¹ [X20] ² [X20] ³ ... [X20] ⁿ ←	Verbose mode 2 and 3
NOTES: [X1] = Input number [X3] = Output number [X9] = Emulation status [X12] = Input connection status [X20] = Output connection status [X30] = Slot number			
		01 - <maximum number of inputs> 01 - 04 0 = Off 1 = On 0 = Off 1 = On 0 = No active connection on A or B 1 = 1st (A) port is connected but the 2nd (B) port is not connected 2 = 1st (A) port is not connected but the 2nd (B) port is connected 3 = Active connection on both A and B 01 - 10 0 = Hard coded, representing all outputs	

Using the Command/Response Table for IP SIS Commands

The **Command and Response Table** begins on page 42.

Symbol Definitions

X51	= Specific port number	01 – 99 00 = reserved The port number is represented as two ASCII characters (for example, port 05 would be represented as 30 35 in hex).
X52	= GMT offset	-12.0 - +14.0 Hours and minutes are removed from GMT.
X53	= On/Off status	0 = off or disabled 1 = on or enabled
X54	= Unit name	Text string up to 24 characters (A-Z, 0-9, and "-"). Not case sensitive.

NOTE: The following characters are invalid or not recommended in the name: ~ , @ = ' [] { } < > ` " ; : | \ ? and *space*
The first character must be an alpha character, the last must not be a hyphen.

X55	= Time and date (set and read)	MM/DD/YY·HH:MM:SS MM = month: 01 (January) through 12 (December) DD = day: 01 through 31 YY = year: 00 through 99 HH = hour: 00 through 23 MM = minutes: 00 through 59 SS = seconds: 00 through 59
X56	= IP or gateway address	nnn.nnn.nnn.nnn

NOTE: Factory default IP/Gateway address: 192.168.254.254

X57	= E-mail domain name	Standard name conventions apply; for example, <i>xxx.com</i> .
------------	----------------------	--

NOTES: • The following characters are invalid or not recommended in the name: ~ , @ = ' [] { } < > ` " ; : | \ ? and *space*
• The @ character is acceptable only as lead-in to the domain name (such as @extron.com)

X58	= Hardware (MAC) address	xx-xx-xx-xx-xx-xx
X59	= Default name	SMX-xx-xx-xx
X60	= Subnet mask	nnn.nnn.nnn.nnn

NOTE: Leading zeros in each of the four fields are optional in setting values and suppressed in returned values.

X63	= Verbose mode	Ø = clear/none (default for Telnet connections) 1 = verbose mode (default for RS-232 and RS-422 connections) 2 = tagged responses for queries 3 = verbose mode and tagged for queries
X66	= Baud rate	9600 (default), 9200, 38400, 115200
X67	= Parity	O = odd E = even N = none M = mark S = space
X68	= Data bits	7, 8
X69	= Stop bits	1, 2
X70	= Port type	0 = RS-232 (default) 1 = RS-422 2 = RS-485
X73	= Web page priority flag	0 = internal (default factory reset) 1 = user
X74	= Password	12 digits, alphanumeric User or admin

NOTES:

- The following characters are invalid or not recommended in the name: ~ , @ = ' [] { } < > ` " ; : | \ ? and *space*
- User password cannot be assigned if no admin password exists (returns error code E14). When admin password is cleared, then user and all security level passwords are deleted.

X75	= Daylight Savings Time	Ø = Daylight Savings Time off or ignore 1 = Daylight Savings Time on (USA - April to October) 2 = Daylight Savings Time on (Europe - March to October) 3 = Daylight Savings Time on (Brazil - October to March)
X76	= Event number	Ø - 99 Event must be running.
X77	= Event data size	b = bit B = byte (8 bits) S = short (16 bits) L = long (32 bits)

NOTE: The parameter is case sensitive and may be optionally preceded by A (And) or O (Or) to logically combine with content instead of replacing it.

X79	= Number of bytes to read	1 - 127
X80	= E-mail event number or mailbox	1 - 64 Response is 3 digits with leading zeros.
X81	= E-mail recipient address	
X82	= E-mail account	65 - 72

X83	= Notification selection 1	I = inputs F = fans P = power supply
X84	= Notification selection 2	If X83 = I, then X84 = 00 (all inputs, or 1 - 16) If X83 = F, then X84 = 00 (both fans), or 01 (fan 1), or 02 (fan 2) If X83 = P, then X84 = 00 (both power supplies), or 01 (PS 1), or 02 (PS 2)
X85	= Notify what?	0 = no response 1 = failed or missing 2 = fixed or restored 3 = both (1 and 2) 4 = suspend 5 = un-suspend
X87	= Default name	Combination of the model name and the last three pairs of the MAC address; for example, IPL - T - S2 - 00 - 02 - 3D.
X88	= The number of seconds before a timeout on IP connections	1 - 65000 seconds 30 (300 seconds) = default If no data is received during the time- out period, the Ethernet connection is closed. Each step is 10 seconds. This is applicable to Ethernet only. When the unit is connected via RS-232 or RS- 422, only the global timeout commands apply, current returns E13. Response is returned with leading zeros.
X89	= Number of open connections	0 - 255
X90	= Slot address	00 = F and P 01 - 10 = I

Command/Response Table for IP SIS Commands

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Setup Commands			
Set unit name	[Esc] [X54] CN ←	Ipn • [X54] ↵	
Reset unit name to factory default	[Esc] • CN ←	Ipn • [X59] ↵	
Read unit name	[Esc] CN ←	[X54] ↵ or [X59] ↵	
Set time and date	[Esc] [X55] CT ←	Ipt • [X55] ↵	See Symbol Definitions on page 53 for more details.
Read time and date	[Esc] CT ←	[X55] ↵	
Set GMT offset	[Esc] [X52] CZ ←	Ipz [X52] ↵	
NOTE: In the command, the divider between hours and minutes can be either a colon or a period. In the response, the divider is a colon.			
<i>Example:</i>	[Esc] 8.0CZ ←	Ipz+08:00 ↵	
Read GMT offset	[Esc] CZ ←	[X52] ↵	
Set Daylight Saving Time	[Esc] [X75] CX ←	Ipx [X75] ↵	
Read Daylight Saving Time	[Esc] CX ←	[X75] ↵	
Set DHCP on	[Esc] 1DH ←	Idh1 ↵	
Set DHCP off	[Esc] 0DH ←	Idh0 ↵	
NOTE: Setting DHCP from on to off will reset the IP address to factory default (192.168.254.254).			
View DHCP mode	[Esc] DH ←	[X53] ↵	
Set IP address	[Esc] [X56] CI ←	Ipi • [X56] ↵	
Read IP address	[Esc] CI ←	[X56] ↵	
Read hardware address (MAC)	[Esc] CH ←	[X58] ↵ Iph • [X58] ↵	00-05-A6-xx-xx-xx = MAC address Verbose mode 2 and 3
Read # of open connections	[Esc] CC ←	[X89] ↵	0 - 200 = number of open connections

NOTES:		
[X52] = GMT offset		-12.0 through +14.0 hours and minutes removed from GMT
[X53] = DHCP mode status		0 = off or disabled 1 = on or enabled
[X54] = Unit name		Text string up to 24 characters (A-Z, 0-9, and "-"). Not case sensitive.
[X55] = Time and date (set and read)		MM/DD/YY·HH:MM:SS
[X56] = IP/Gateway address		nnn.nnn.nnn.nnn, Factory default IP address: 192.168.254.254
[X58] = Hardware (MAC) address		nn.nn.nn.nn.nn.nn
[X59] = Default Name		Combination of model name and last 3 pairs of MAC address (SMX-00-02-3D)
[X75] = Daylight savings time		0 = Daylight Savings Time off or ignore 1 = Daylight Savings Time on (USA) 2 = Daylight Savings Time on (Europe) 3 = Daylight Savings Time on (Brazil)
[X89] = Number of open connections		0 - 200

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Set subnet mask	[Esc] [X60] CS ←	Ips • [X60] ↵	
Read subnet mask	[Esc] CS ←	[X60] ↵	
Set gateway IP address	[Esc] [X56] CG ←	Ipg • [X56] ↵	
Read gateway IP address	[Esc] CG ←	[X56] ↵	
Set administrator password	[Esc] [X74] CA ←	Ipa • [X74] ↵	12 digits, alphanumeric
Read administrator password	[Esc] CA ←	[X74] ↵	
Reset (clear) administrator password	[Esc] • CA ←	Ipa • [X74] ↵	
Set user password	[Esc] [X74] CU ←	Ipu • [X74] ↵	
Read user password	[Esc] CU ←	[X74] ↵	
Reset (clear) user password	[Esc] • CU ←	Ipu • [X74] ↵	
Set verbose mode	[Esc] [X63] CV ←	Vrb [X63] ↵	Enable or disable verbose mode and tagged responses, where additional information is provided in response to a query.
NOTE: The SMX can send out unsolicited information (such as a notice of a change in input or some other setting). This is a verbose (wordy) relationship between the switcher and a connected device. For a direct RS-232 or RS-422 connection, the SMX is set for verbose mode by default. When the SMX is connected via Ethernet, verbose mode is disabled by default in order to reduce the amount of communication traffic on the network. If you want to use verbose mode with a switcher connected via Ethernet, you must set this mode to On each time you reconnect to the SMX.			
View verbose mode	[Esc] CV ←	[X63] ↵	Show verbose mode or tagged response status [X63] .
Set mail server IP, unit domain name	[Esc] [X56] , [X57] , [X74] , [X74] CM ←	Ipm • [X56] , [X57] , [X74] , [X74] , ↵	Password (12 digits, user or admin)
NOTE: Password is option. If no password is being used, type [Esc] [X56] , [X57] CM ↵			
Read mail server IP, domain name	[Esc] CM ←	[X56] , [X57] , [X74] , [X74] , ↵	
NOTES: [X56] = IP/Gateway address [X57] = E-mail domain name [X60] = Subnet mask [X63] = Verbose mode [X74] = Password <div> <div>###.###.###.### (server IP address)</div> <div>For example, extron.com</div> <div>nnn.nnn.nnn.nnn</div> <div>255.255.0.0 = default</div> <div>0 = Clear or none (default for Telnet connection)</div> <div>1 = Verbose mode (default for RS-232 and RS-422 connections)</div> <div>2 = Tagged responses for queries,</div> <div>3 = Verbose mode and tagged for queries</div> <div>12 digits and alphanumeric, user or admin</div> </div>			

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Set e-mail recipient	[Esc] [X82] , [X81] CR ←	Ipr [X82] , [X81] , ←	Sets e-mail address to account [X82] .
Read e-mail recipient	[Esc] [X82] CR ←	[X81] , ←	Read e-mail address of account [X82] .
Set e-mail events for recipient <i>Example:</i>	[Esc] [X83] [X82] , [X90] , [X84] , [X85] EM ← [Esc] I 65, 02, 00, 2 EM ←	[X90] Ipe [X83] , [X82] * [X84] * [X85] ... [X85] ← 02 Ipe I 65 * 00 * 2222222222222222 ←	
View e-mail events for recipient	[Esc] [X83] [X82] , [X90] , [X84] EM ←	[X85] [X85] [X85] ... [X85] ←	
Set serial port parameters	[Esc] * [X51] , [X66] , [X67] , [X68] , [X69] CP ←	Cpn [X51] Ccp [X66] , [X67] , [X68] , [X69] ←	
Read serial port parameters	[Esc] [X51] CP ←	[X66] , [X67] , [X68] , [X69] ←	
Set mode	[Esc] [X51] * [X70] CY ←	Cpn [X51] • Cty [X70] ←	Sets port [X51] for RS-232 or RS-422 control.
Read mode	[Esc] CY ←	[X70] ←	
Set current conn port timeout	[Esc] 0 * [X88] TC ←	Pti 0 * [X88] ←	
Read current conn port timeout	[Esc] 0 TC ←	[X88] ←	
Configure global IP port timeout	[Esc] 1 * [X88] TC ←	Pti 1 * [X88] ←	
Read global IP port timeout	[Esc] 1 TC ←	[X88] ←	

NOTES: [X51] = Specific port number	01 - 02
	9600 = default
[X66] = Baud rate:	19200
	38400
[X67] = Parity:	115200
	0 = odd
[X68] = Data bits	E = even
	N = none
[X69] = Stop bits	M = mark
	S = space
[X70] = Port type	7, 8
	1, 2
[X81] = E-mail recipient address	0 = RS-232 (default)
	1 = RS-422
[X82] = E-mail Account	65 - 72
	I = inputs
[X83] = Notification Selection 1	F = fans
	P = power supply
[X84] = Notification Selection 2	If [X83] = I, then [X84] = 00 (all inputs), or 1 - 16
	If [X83] = F, then [X84] = 00 (both fans), 01 (fan 1), or 02 (fan 2)
[X85] = Notify when ?	If [X83] = P, then [X84] = 00 (both power supplies), 01 (PS 1), or 02 (PS 2)
	0 = No response
[X88] = The number of seconds x10 before timeout on IP connections	1 = Failed or Missing
	2 = Fixed or Restored
[X90] = Slot address	3 = Both 1 and 2
	4 = suspend
	5 = Un-suspend
	1 - 65000 = 10 - 650,000 seconds
	30 = default (300 seconds)
	00 = fan and power supply
	01 - 10 = inputs

SMX Control Software

The following software programs accompany SMX switchers:

- The Windows-based Extron SMX Control Program, which communicates with the SMX via the RS-232/RS-422 port and the Ethernet port, provides an easy way to set up ties and sets of ties.
- The Extron Button-Label generator allows you to design and print labels for the SMX front panel buttons.

Both programs are compatible with Windows 2000/XP or later. Updates to these programs can be downloaded from the Extron Website (www.extron.com).

Topics in this section include:

- [Installing and Starting the SMX Control Program](#)
- [Using Emulation Mode](#)
- [Using the Program](#)

TIP:

- The HTML language reserves certain characters for specific functions. The SMX does not accept these characters as part of preset names, the switcher name, passwords, or locally created file names.
- Unless otherwise specified, the following characters are invalid or not recommended for SMX inputs: + ~ , @ = ' [] { } < > " ; : | \ ? and *space*

Installing and Starting the SMX Control Program

The SMX can be operated via the Windows-based SMX Control Program. This program is contained on the Extron Software Products DVD (included with the SMX). Install and run this program on a Windows-based PC connected to either of the SMX serial ports or the Ethernet port (see ② and ④, on [pages 7](#) and [8](#), for connection information). It cannot be run from the DVD.

Installation the Program

1. Insert the DVD into the drive. The DVD self starts and the Extron Software window opens.

NOTE:

- The DVD starts only if you have a DVD drive on your PC.
- If the disc does not start automatically, run LAUNCH.EXE from the disc drive.



2. Click the **Software** tab.
3. Scroll to the SMX Control Program and click **Install**.



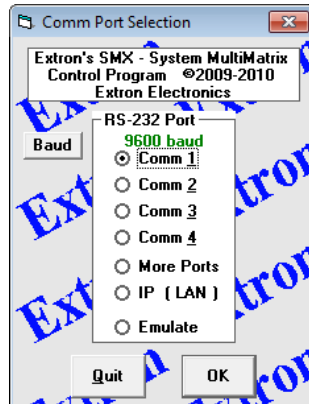
4. Follow the on-screen instructions. The installation program creates a C:\Program Files\Extron\SMX folder.

Within this folder are created three icons for the SMX Control pgm, SMX Help, Uninstall SMX Control pgm.

Starting the Program

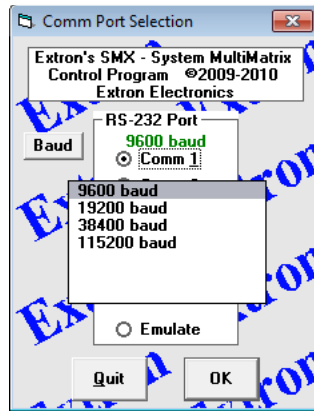
1. Click **Start > Programs > Extron Electronics > SMX Control Program > SMX Control Pgm** (or select the desktop icon, if created during installation).

The Comm Port Selection window appears.

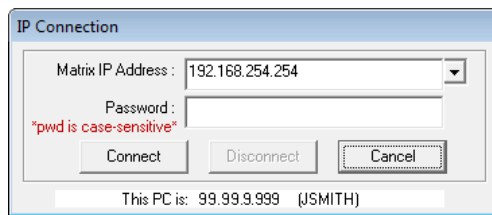


2. Choose the comm (serial) port that is connected to the SMX or **IP [LAN]**.

NOTE: For a comm port, check the baud rate displayed in the comm port selection window. To change the baud rate, click the **Baud** button and select the desired baud rate from the list.



- If you select a comm port, click **OK** and proceed to the [Using the Program](#) section on page 62.
 - If you selected IP [LAN], click **OK** and proceed to step 3.
 - If you selected Emulate, click **OK** and proceed to the [Using Emulation Mode](#) section on page 61.
3. If you selected **IP [LAN]** in step 2, the IP Connection window opens.



- a. The **Matrix IP Address** field defaults to the last IP address entered. A drop-down list to the right contains the most recently used IP addresses. Select the desired IP address from the list or enter it in the field.

NOTE: 192.168.254.254 is the factory-specified default IP address.

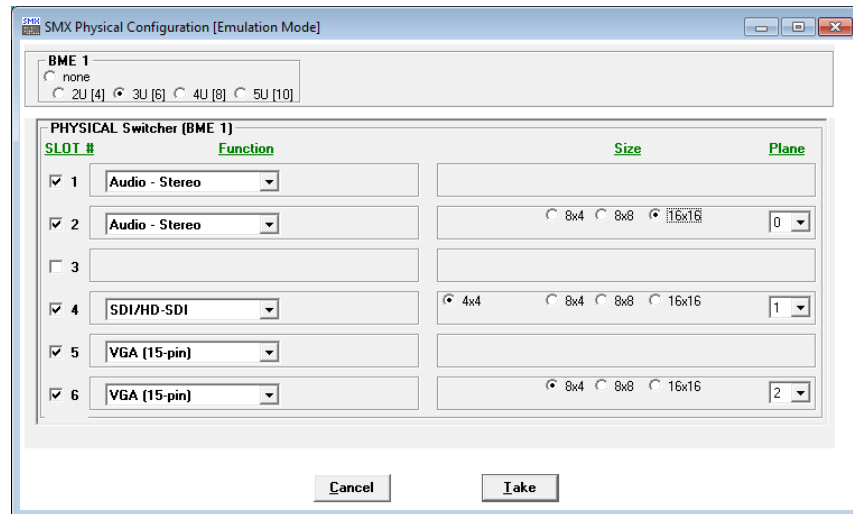
- b. If the SMX is password-protected, enter the appropriate administrator or user password in the **Password** field.
- c. Click **Connect**. The SMX Control Program is ready for operation.
- If you logged on using an administrator password, the Windows program connects to the SMX with all of the administrator rights and privileges.
 - If you logged on with a user password, the Windows program connects you to the SMX with only user capabilities.
 - If an incorrect password is entered, the program beeps and returns to the password entry dialog box.

Using Emulation Mode

Emulation mode allows you to set up the software without attaching the SMX to the computer. To use Emulation mode, do the following:

1. Open the SMX Control Program (see [Starting the Program](#) on page 60)
2. From the Comm Port Selection window, select **Emulate** and click **OK**.
3. Choose an emulation file to open and click **OK**. The file **DEMO_SMX10.MTX** provides a sample of a completed matrix setup. Selecting the file **NEW.INI** or clicking **Cancel** provides a blank setup.

4. Select the file name under which you want to save any changes to the file and click **OK**. The SMX Physical Configuration [Emulation Mode] window appears.



5. Select the signal type boards, board sizes, plane addresses, and matrix model for which you are preparing a configuration and click **Take**.
6. The SMX Control Program window opens (see [Using the Program](#) below).

Using the Program

At startup, the SMX Control Program window appears (see [figure 30](#)). The window displays the current configuration of the SMX (the numbered boxes represent the video and audio inputs and outputs and initially opens at the lowest plane). Each plane has a separate numbered tab from 0-15, that are shown at the right side of the main window (in the example below, only planes 0 and 1 are being used).

NOTE: Each SMX system configuration varies per installation. The screens shown throughout this section may look different from the ones displayed on your computer.

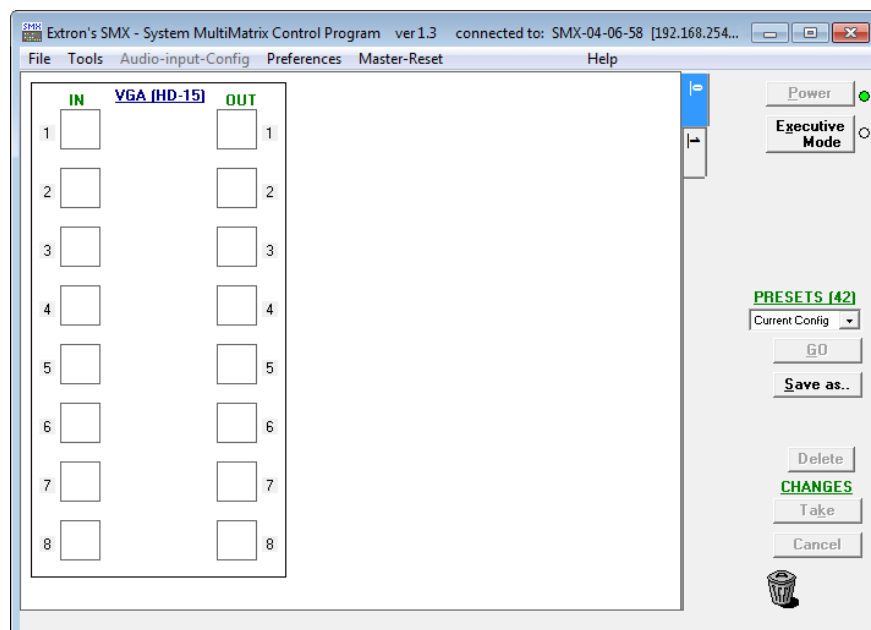


Figure 30. Video Inputs and Outputs on Plane 0 — No Ties

Each tab is selectable and turns highlights when selected (see [figure 31](#) for an example of audio inputs and outputs on plane 1).

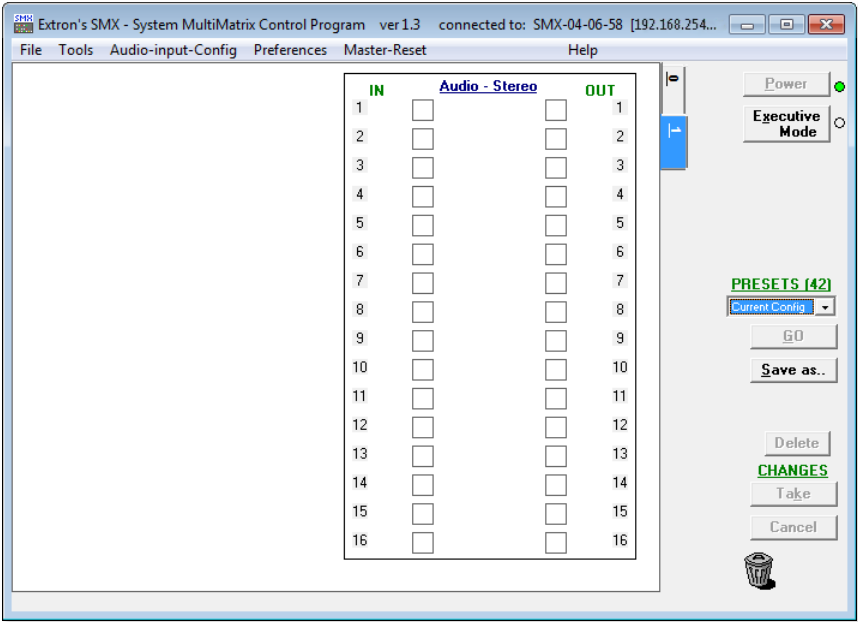


Figure 31. Audio Inputs and Outputs on Plane 1 — No Ties

Across the top of the main window is the menu bar, and at the right edge of the window, various selectable buttons are available, depending on the current configuration.

NOTE: Depending on the particular SMX configuration, some menus, submenus, and buttons may appear grayed out and are not selectable.

Control Program Menus and Pages

There are six top level menu items on the menu bar: **File**, **Tools**, **Audio-input Config**, **Preferences**, **Master Reset**, and **Help**.

File Menu

This drop-down list (see [figure 32](#)) has the following items: **Save Matrix settings as...**, **Restore Matrix settings from...**, **Save This-Session's settings**, **Restore Last-Session's settings**, **Select printer...**, **Print Tie Map**, and **Exit**.

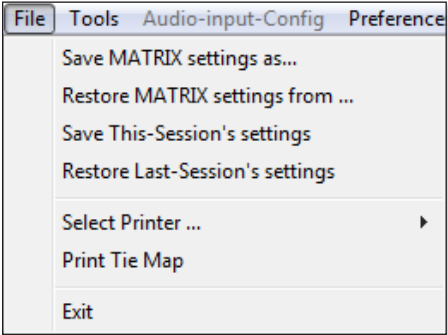


Figure 32. File Menu

- **Save Matrix settings as...** — Select this option to save the current matrix settings (ties, presets, Virtual plane, and audio settings) to a restorable file (*.mtx).

- **Restore Matrix settings from...** — Select this option to restore saved matrix settings files (*.mtx) and overwrite the current settings.

NOTE: All current settings (ties, presets, Virtual plane, and audio settings) unless already saved, are replaced.

- **Save This-Session's settings** — Select this option to save the specific session settings (ties, presets, rooms, and audio settings) to file (*.ini), which can be used for restoring those settings later.

NOTE: The last saved settings within the same *.ini file are overwritten.

- **Restore the Last-Session's settings** — Select this option to restore the last session settings from a saved file (*.ini).

NOTE: The current settings (ties, presets, rooms, and audio settings) are overwritten by the restored settings.

- **Select printer** — Selecting this opens a second drop-down list listing the available printers connected to the PC.
- **Print Tie Maps** — Select this option to print the tie map in the active window to the default or currently selected printer.
- **Exit** — Select this option to close the SMX control program. Current settings are maintained and loaded upon restart.

NOTE: Alternatively, click on the red X in the top right corner of the main window to close the SMX Control Program.



Tools Menu

This drop-down list (see [figure 33](#)) has the following items: **Assign Device Icons**, **Edit Device Palette**, **RGB Delay settings**, **Audio-input Gain settings**, **Audio-Output Volume settings**, **Mute-Output settings**, **HD-SDI Re-clocker Rate settings**, **EDID settings**, **HDCP Status**, **USB Settings/Status**, **View Input Frequencies**, **Update Firmware...**, **IP Options**, **HTML File Manager**, **Hardware Status**, **Physical Switcher config**, **Virtualize...**, and **Name Presets**.

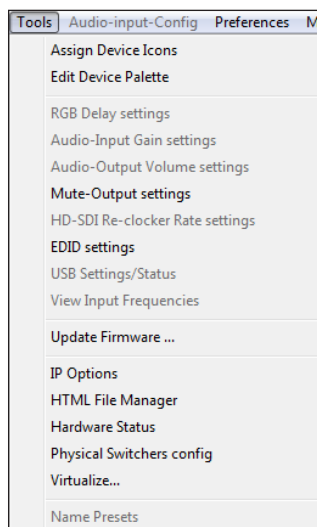


Figure 33. Tools Menu

- **Assign Device Icons** — Select this option to add specific device icons to the main window input and output boxes. This opens a new window showing input and output device icons. Drag and drop an icon onto the applicable input or output boxes.

NOTE: Alternatively, clicking on either input or output boxes opens the relevant icon window. Drag and drop an icon onto the boxes.



- **Edit Device Palette** — Selecting this option opens the Editor window (see [figure 34](#)). To edit an icon name, swap, or upload a new icon, select the icon number, click **Edit** and follow the on-screen prompts. Any changes made are shown in the Device Palette when next selected (see [Customizing the SMX Window](#) on page 75).

Click **Close** to exit the Device Palette Editor window.



Figure 34. Device Palette Editing Windows

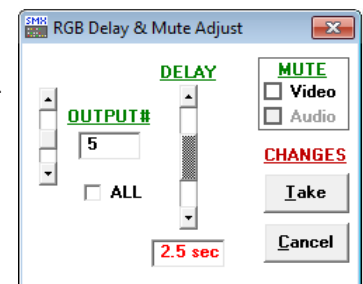
- **RGB Delay (VGA and RGBHV boards only)** — Select this option to change and set RGB Delay for any selected outputs. The RGB Delay and Mute Adjust window opens.

NOTE: To select all outputs, check the **ALL** box.

To change or set RGB delay:

1. Select an output (or **All**) and adjust the RGB Delay slider to set the desired delay (in 0.5-second steps).
2. Click **Take** to accept the change, or click **Cancel** to ignore the change.
3. Click **Close** to exit the window.

NOTE: This menu also contains Mute Output settings (see [Mute Output settings](#) on page 66 for the procedure).



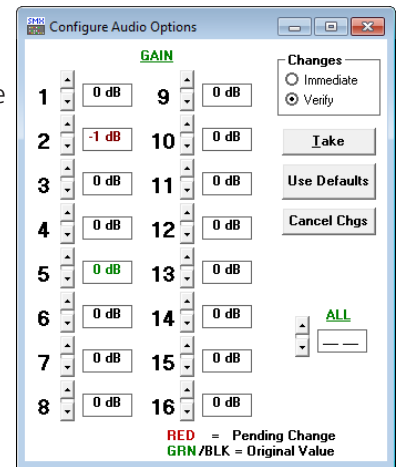
- **Audio-Input Gain settings** — Select this to change the audio gain (0.5 dB steps) for all or single inputs.

To change the gain, pick an input (or **All**) and use the adjustment arrows to raise or lower the gain.

NOTE: Click on the applicable Changes radio buttons to have any changes either immediate or verifiable.

Verify (default setting) accepts changes after the **Take** button is pressed.

Immediate accepts changes instantly. The **Take** button is removed.

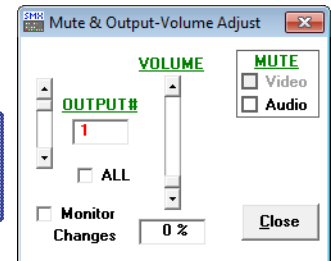


- Click **Take** (if visible) to accept the changes.
- Click **Use Defaults** to set the selected input to the default setting.
- Click **Cancel Change** to return the gain to the previous setting.

- **Audio Output Volume settings** — Select this option to change the audio volume (in 1% steps) for all or single outputs.

To change the volume, pick an output (or **All**) and raise or lower the volume slider.

NOTE: When an RGB input is connected, this menu also shows the RGB delay settings (see [RGB Delay settings](#) on page 65).



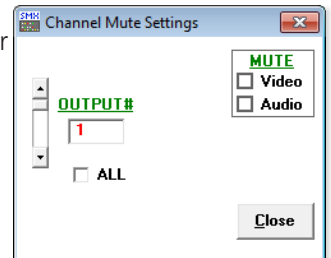
Click **Close** to exit the window.

To mute video or audio output, select either check box in the Mute box per selected output number (or **All**).

- **Mute Output settings** — Select this option to mute any or all video or audio outputs.

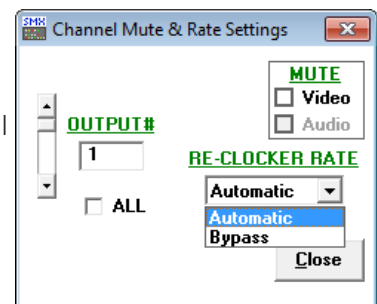
To mute a video or audio signal, select an output (or **All**) and check the video or audio mute box. The output is now muted, and the output box in the main window indicates the mute status.

Click **Close** to exit the window.



NOTE: When an RGB input is connected, this menu also shows the RGB Delay settings (see [RGB Delay settings](#) on page 65).

- **HD-SDI Re-clocker Rate settings** — Select this option to reset the reclocking rate for HD-SDI inputs. The Re-clocker rate sets the outputs in sync with input signals. If an audio board is set to the plane address, a slider will become available for volume adjustment in this dialog box.



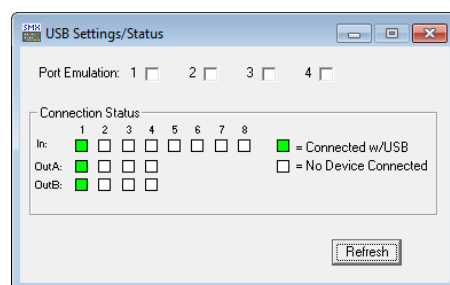
- **EDID settings** — Select this option to set the EDID settings for selected inputs, and to save the output to any of four user defined outputs.



Select **Advanced Info** to view the EDID data for any selected output (see the [above right](#) side image), and to save a record to a User defined ID (User 1-4).

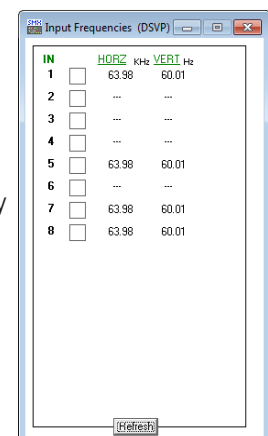
NOTE: The drop-down list has 41 selections, where: **15** is the default for DVI (1024x768 @ 60 Hz), **32** is the default for DVI-Pro (720p), **0** = automatic, **1 - 8** is data stored from connected EDID monitors as reference, **9 - 26** are factory fixed rates, and **37 - 40** are user assignable (**37** = User 1, **38** = User 2, **39** = User 3, **40** = User 4). See the [EDID table](#) on page 41 for the full list.

- **HDCP Status** — Select this option to view whether inputs or outputs are connected with HDCP compliance. This information can also be viewed by selecting **EDID Settings**.
- **USB Settings/Status** — Select this option to view the connection status and port emulation settings for USB boards. Select the numbered check boxes in the Port Emulation section to enable or disable the port emulation feature of SMX USB boards.



- **View Input Frequencies** — Select this to view the horizontal and vertical frequencies for any input. Click **Refresh** to manually update the list.

NOTE: If the **Frequency-read options** setting under the **Preferences** menu is set to **None**, then **View Input Frequencies** is not available.



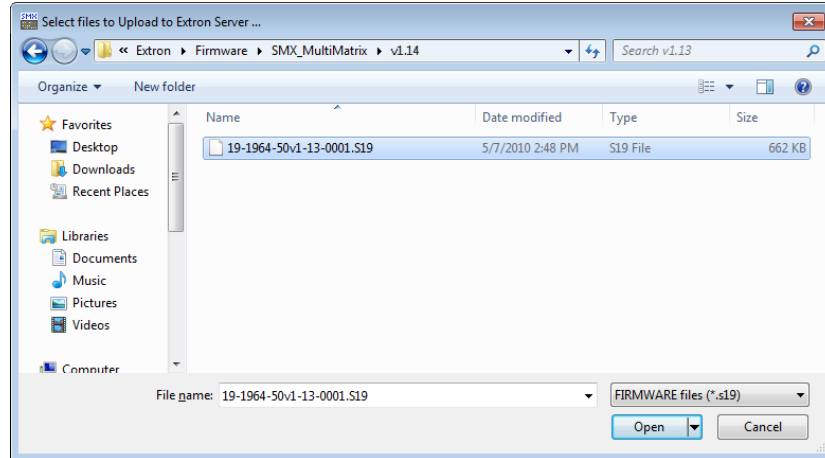
- **Update Firmware...** — Select this option to update the SMX with the latest firmware. To download the latest firmware version from the Extron website (www.extron.com):
- 4. On the Extron web page, select the **Download** tab.
- 5. Click the **Firmware** link on the left sidebar menu.



- 6. Click on “**S**,” scroll to SMX Multi Matrix switcher, and then click **Download**.
- 7. Fill in the required information, then click **Download product name_firmware version.exe**.
- 8. In the File Download - Security Warning window, click **Save**.
- 9. In the Save As window, browse to the folder where you want to save the firmware file, and click **Save**. The firmware installation file (*.S19) is saved on your hard drive.

To upload the firmware to the SMX:

- 1. Select **Update Firmware** and browse to the folder where the downloaded firmware file (*.S19) was saved.
- 2. Select the applicable file and click **Open**. The file is uploaded.



When the SMX unit has restarted, check that all the previous ties and settings have been restored and restart any control programs (for example, DataViewr, SMX Control Program, web pages) that were previously open.

- **IP Options** — Select this to view and change the IP settings, Date/Time settings, and Administrator/User access names and passwords for the SMX, E-mail addresses and notification settings can also be changed.

IP Settings / Options

Matrix IP Address : 192.168.254.254 Extron Name/Descriptor : SMX-04-06-58
 Gateway IP Address : 0.0.0.0 Subnet Mask : 255.255.0.0
 Hardware Address : 00-05-A6-04-06-58 ☐ Use DHCP (Obtain an IP address automatically)

Date : Fri, 13 May 2011 Time (local) : 10:16:32 Sync time to PC GMT : -08:00 ☒ Use Daylight Saving

Administrator Password : User Password :

Mail Server
 IP Address : 192.168.254.35 Domain Name : anywhere.com

	E-mail Addressee	None	Fail	Fixed	Both	Missing Input(s)	Fans	Power Supply
1	Sample01@anywhere.com	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Sample02@anywhere.com	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Slot 1 2 3 4 5 6 7 8
 Slot 1 2 3 4 5 6
 VGA (HD-15)

Send test E-mail

This PC is: 99.99.9.999 (JSMITH) Cancel Take

To change the IP settings complete the applicable fields or check the **User DHCP** box to automatically obtain an IP address. The **Take** button appears and the **Close** button changes to **Cancel**. Click **Take** to accept the changes or **Cancel** to reset the fields to the previous settings. Click **Close** to close the window.

NOTE: Fields that appear grayed out are not changeable.

To change the date and time settings, complete the applicable fields or click the **Sync time to PC** button.

To create or change the administrator and user passwords, edit the applicable fields.

NOTE: An administrator password must be created before a user password can be. The characters + ~ , @ = ' [] { } < > ` " " ; : | \ ? and *space* are invalid or not recommended in passwords.

To add or configure e-mail addresses, complete the fields as desired.

- **HTML File Manager** — Select this option to add or remove user created web files.

HTML FILES LIST

List SubDirectories ☐

-- ROOT

extronweb

File Name	Time & Date	Length
buttons.xml	Mon, 10 Jan 2005 19:56:56 GMT	17221
confroom_Aud_22.gif	Mon, 10 Jan 2005 20:21:55 GMT	939
confroom_control.html	Mon, 10 Jan 2005 20:21:55 GMT	48891
confroom_VCR_02.gif	Mon, 10 Jan 2005 20:21:57 GMT	1357
security_Aud_21.gif	Mon, 10 Jan 2005 20:21:57 GMT	778
security_VCR_01.gif	Mon, 10 Jan 2005 20:21:57 GMT	1151

1,171,968 Bytes Left

FILES 6 Delete Selected File(s) Pick File(s) to Load to Server Get Selected File(s) from Server Update Close Directory Functions

To select a file from the server list, click **Pick Files to Load to Server**, then click **Get Selected Files...** or **Delete Selected Files...** as desired.

Click **Update** to refresh file list.

- **Hardware status** — Select this option to check status of various hardware components, view serial port configuration, and view firmware details.
 - Click **Update** to refresh the window with real time information.
 - Click **Close** to exit the window.

SMX300 (6 slot) w/FPC System Status

Hardware Status		Serial Port Configuration	
Power Supplies		Port Type =	RS-232
primary	+ 5 Volts = 4.98	Baud Rate =	9600
secondary	+ 24 Volts = 24.22	Data Bits =	8
Fans		Parity =	N
left	0 RPM	Stop Bits =	1
right	0 RPM		
Temperature = 100.0 F / 37.8 C			

Firmware Version = 1.13 Kernel Version = 1.81 Firmware Loaded/Updated = Tue, 25 May 2010 16:29:14 GMT

Events Running = 0

Open IP connections = 1 **Update** **Close**

☒ = Installed /Working
☐ = Failed
☐ = Not Installed

- **Physical switchers config** — Select this option to view the I/O board types/sizes per slot.

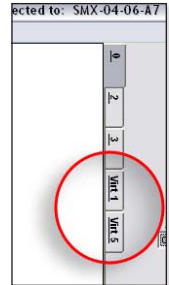
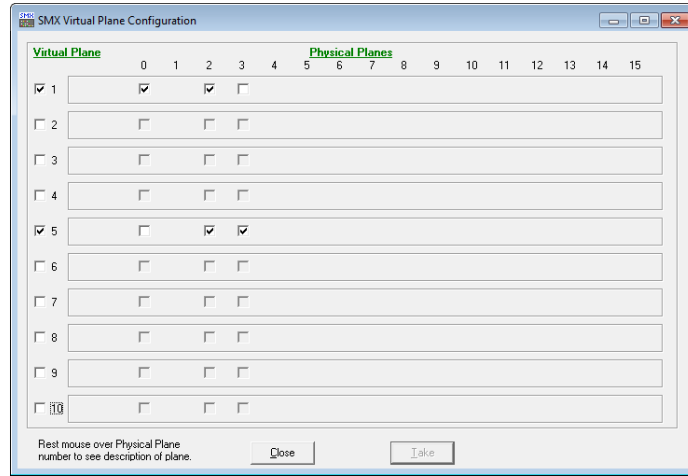
SMX Physical Configuration

BME 1
☐ none
☐ 2U [4] ☐ 3U [6] ☒ 4U [8] ☐ 5U [10]

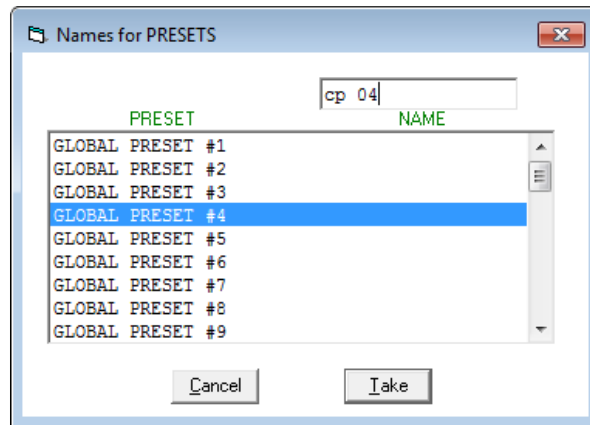
PHYSICAL Switcher (BME 1)		Details	Size	Plane
SLOT #	Function			
<input checked="" type="checkbox"/> 1	Fiber-optic (Multi-mode)	1 2 3 4 5 6 7 8 M M M M M - - S	Close	0
<input checked="" type="checkbox"/> 2	DVI			
<input checked="" type="checkbox"/> 3	DVI		<input type="radio"/> 4x4 <input type="radio"/> 4x8 <input type="radio"/> 8x4 <input checked="" type="radio"/> 8x8	1
<input checked="" type="checkbox"/> 4	SDI/HD-SDI			
<input checked="" type="checkbox"/> 5	SDI/HD-SDI		<input type="radio"/> 4x4 <input type="radio"/> 8x4 <input type="radio"/> 8x8 <input checked="" type="radio"/> 16x16	10
<input checked="" type="checkbox"/> 6	HDMI			
<input checked="" type="checkbox"/> 7	HDMI		<input type="radio"/> 4x4 <input type="radio"/> 4x8 <input type="radio"/> 8x4 <input checked="" type="radio"/> 8x8	5
<input checked="" type="checkbox"/> 8	Audio - Stereo		<input checked="" type="radio"/> 8x4 <input type="radio"/> 8x8 <input type="radio"/> 16x16	11

Close

- **Virtualize...** — Select this option to view and set up to 10 virtual planes. Select a **Virtual Plane** check box then select the desired **Physical Planes** check boxes. Select **Take**. New tabs for the virtual planes (planes 1 and 5 in the example below) appear on the inputs page. This recreates configurations from current boards and configurations onto virtual planes.



- **Name Presets** — Select this to assign or edit preset names.



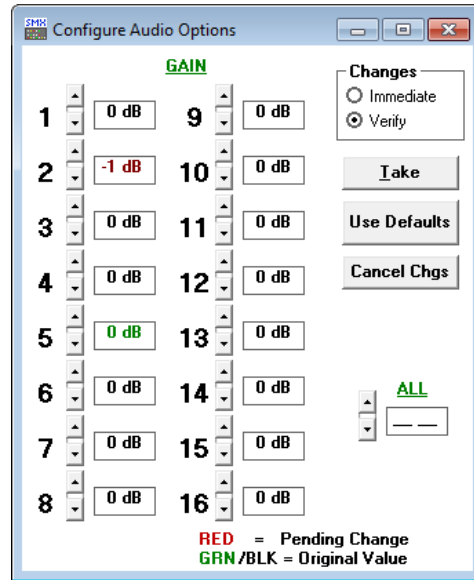
Audio-input-Config

NOTE: This menu title is grayed-out until an audio plane is selected.

Upon selection of this menu, the Configure Audio Options window opens.

- **Configure Audio Options** — Sets the dB gain per audio input.
Click on the applicable **Changes** radio buttons to have the changes either immediate or verifiable.
 - **Verify** (default setting) allows accepting the changes via a **Take** button.
 - **Immediate** removes the **Take** button from the window and all changes are made immediately.

In the window, click on the up or down arrow for the an input until you reach the desired gain value (range is -18 to 24 dB, default 0 dB), then click **Take**. The dB value is black for current values, but turns red when changes are pending or green when the pending change is returned to its original value. Click **Take** to confirm pending changes. If you desire default values (0 dB), click **Use Defaults**.



Click **Cancel** if you want to cancel pending changes and restore the previous settings.

To set all audio inputs to the same gain level, use the **All** field arrows to select the required level. After values have been changed, click **Close** to exit the window.

Preferences

This drop-down list (see [figure 35](#)) has the following selectable items: **Immediate Changes**, **Hold/Verify Changes**, **Ties as Lines**, **Ties as Crosspoints**, **Frequency-read options**, **Icons in I/O boxes**, **Numbers in I/O Boxes**, and **Catch FPC/other's Changes**:

Select or deselect an item from the Preferences menu as required. When an option is selected, a check mark is visible.

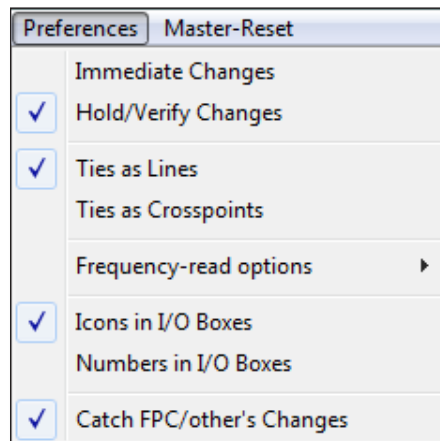
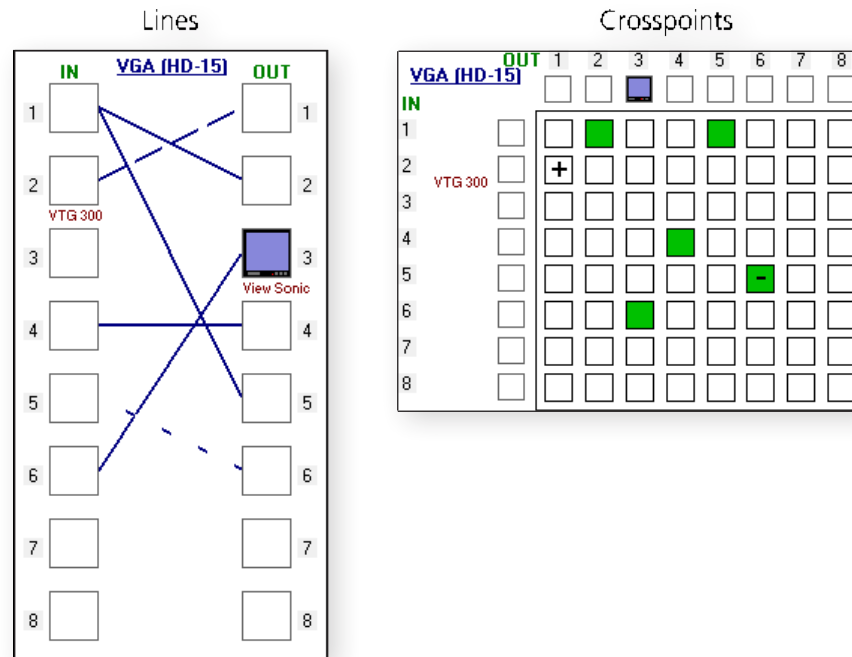


Figure 35. Preferences Menu

- **Immediate Changes** — Selecting this option allows input-to-output tie changes to happen immediately without the need to use the **Take** button.
- **Hold/Verify Changes** — Selecting this option requires a click of the **Take** button to accept changes to ties.

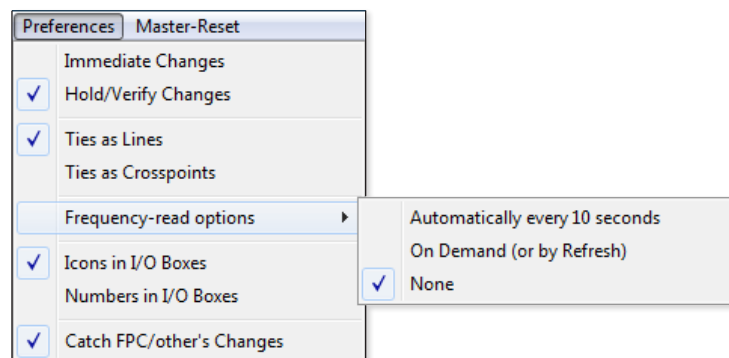
- **Ties as Lines** — Selecting this option displays input to output ties as lines.
- **Ties as Crosspoints** — Selecting this option displays input-to-output ties as points.

The crosspoints diagram is shown as a matrix with ties that have been made indicated by green boxes. Pending ties that will be made after the **Take** button is clicked appear as a + while ties that will be broken appear as a - in the Crosspoint box.



- **Frequency-read options** — Selecting this option displays a sub-menu with three selectable items: **Automatically every 10 seconds**, **On Demand (or by Refresh)**, and **None**. Select the input read and update frequency as desired.

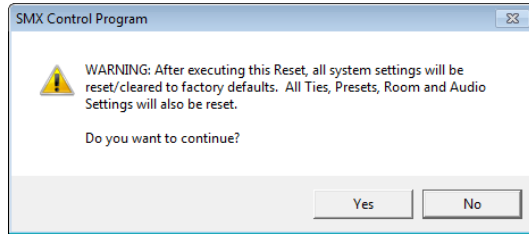
NOTE: When the **Frequency-read options** setting is set to **None**, the **View Input Frequencies** option on the **Tools** menu is not available.



- **Icons in I/O Boxes** — Select this option to show user-assigned icons, or numbers in sequence in the I/O boxes (see the [Customizing the SMX Window](#) section on page 75).
- **Numbers in I/O boxes** — Select this to have the input/output number displayed in the boxes.
- **Catch FPC/other's changes** — Select this option to have the SMX report all configuration and setting changes via the remote RS-232, RS-422, or Ethernet connection. These reports allow the SMX Control Program to track the changes that occur in the switcher configuration and settings, whether commanded via the front panel, the RS-232/RS-422 port, or the Ethernet port.

Master-Reset

Select this menu only if a master reset to factory defaults is desired. It opens a warning window stating the consequences of this action. Click **No** if the reset is not required. Click **Yes** to proceed and complete the reset.



Help

This menu gives access to the SMX Control program help file, and displays limited SMX configuration information.

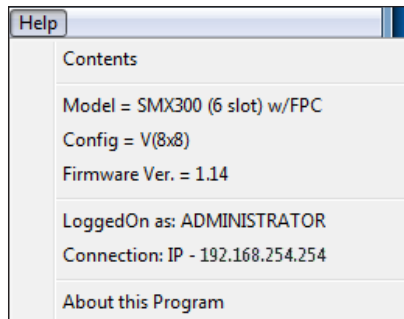


Figure 36. Help Menu

Select **Contents** to view a help file that can orient you through the various menus and commands.

The configuration information (not selectable or configurable) section shows:

- Model type and slot count (here a 3U SMX with 6 slots and front panel control)
- Board signal configuration (here 8x8 video inputs and outputs)
- Firmware version (here 1.14)
- Login mode (here logged in as ADMINISTRATOR)
- Unit connection (here IP/LAN with the default IP address)

Select **Firmware** to open two windows.

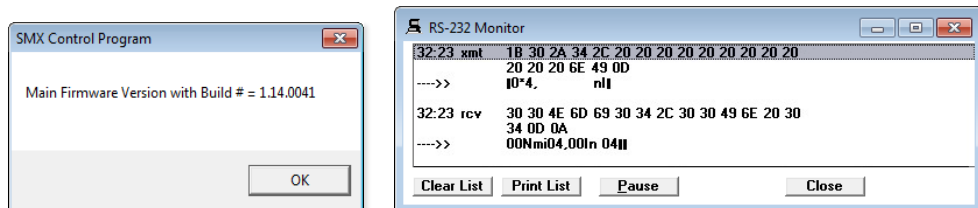


Figure 37. Firmware Version and RS-232 Monitor Window

The first shows the SMX main firmware version and build number (version 1.14, build 0041 in the example above).

The second window is the RS-232 monitor and shows the switcher response.

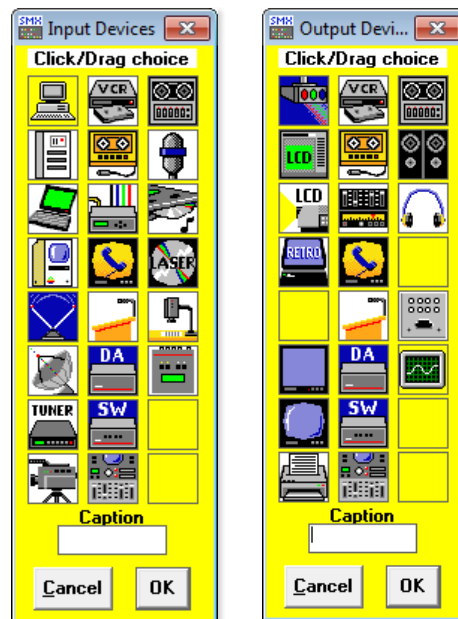
Select **About this Program** to see the software version number. Click **OK** to close the pop-up window.



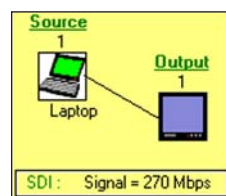
Customizing the SMX Window

In the SMX window, the inputs and outputs are represented by boxes. Customize the control program view by assigning device icons that represent the connected devices to each input and output box.

1. Click on an input or an output box. The Input Devices or Output Devices window opens, containing icons representing various types of devices that may be connected to the SMX.



2. Click and drag an icon from the devices screen to an input or output box on the program window. Repeat for additional devices, as desired.
3. In the **Caption** field, enter a caption (for example, **Laptop**) for the device, if desired. This caption appears in the descriptive window that pops up when you pass the cursor over an input or output box containing an icon.



4. When you are finished assigning icons, click **OK** to close the device window.

To change an icon in an input or output box, drag the new icon to the box. The previous icon is replaced.

To remove the icon and leave the box empty, drag an empty square from the Devices window to the box.

Alternatively, you can display the input and output numbers in the boxes. To do this, select **Numbers in I/O Boxes** from the **Preferences** menu.

Managing Ties

The SMX Control window can create, remove, and view input-to-output ties.

To create a tie

- Click and drag an input box outline over to an output box.
- If **Hold/Verify Changes** has been selected in the **Preferences** menu, a broken line connecting the two boxes appears, indicating a pending tie.

NOTE: If you want to undo the pending tie, click **Cancel**. The broken line disappears.

Click **Take** to confirm the tie. The broken line becomes solid.

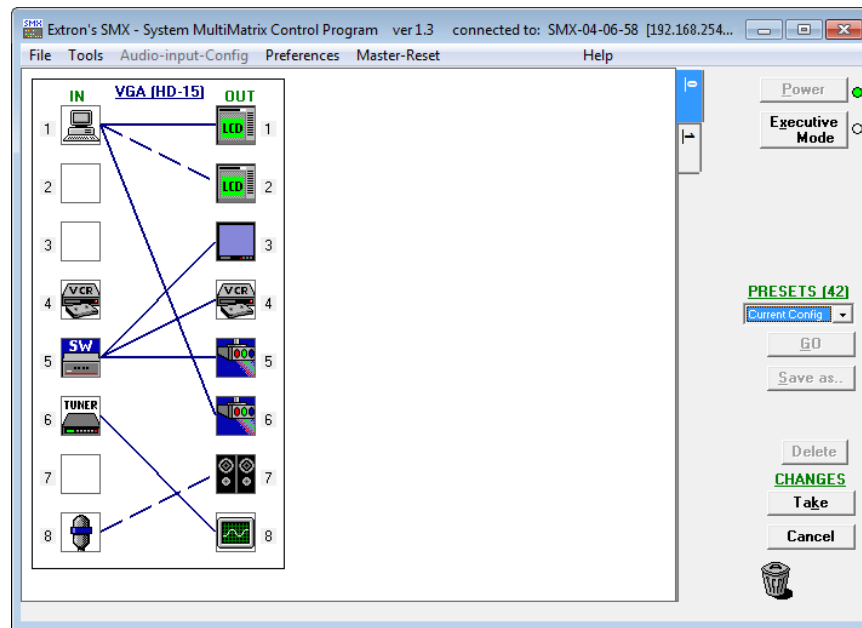


Figure 38. Completed Ties (Solid) and Pending Ties (Broken Lines)

- If **Immediate Changes** has been selected from the **Preferences** menu, the tie is made immediately, a solid line appears, and the **Cancel** and **Take** buttons are not displayed.

To remove a tie

Drag the output box outline to its tied input box or to the trash can.

- If **Hold/Verify Changes** has been selected from the **Preferences** menu, the solid tie line becomes broken.

NOTE: If you want to reinstate the tie, click **Cancel**. The line becomes solid.

Click **Take** to remove the tie. The broken tie line disappears.

- If **Immediate Changes** has been selected from the **Preferences** menu, the tie is removed immediately.

To view information on an input or output

Position the cursor over that device in the matrix window. A pop-up window opens, showing the input and output numbers, names (if captions were specified), details on the connections to that device, and the frequency of the video signal being sent to or from it (see [figure 39](#)).

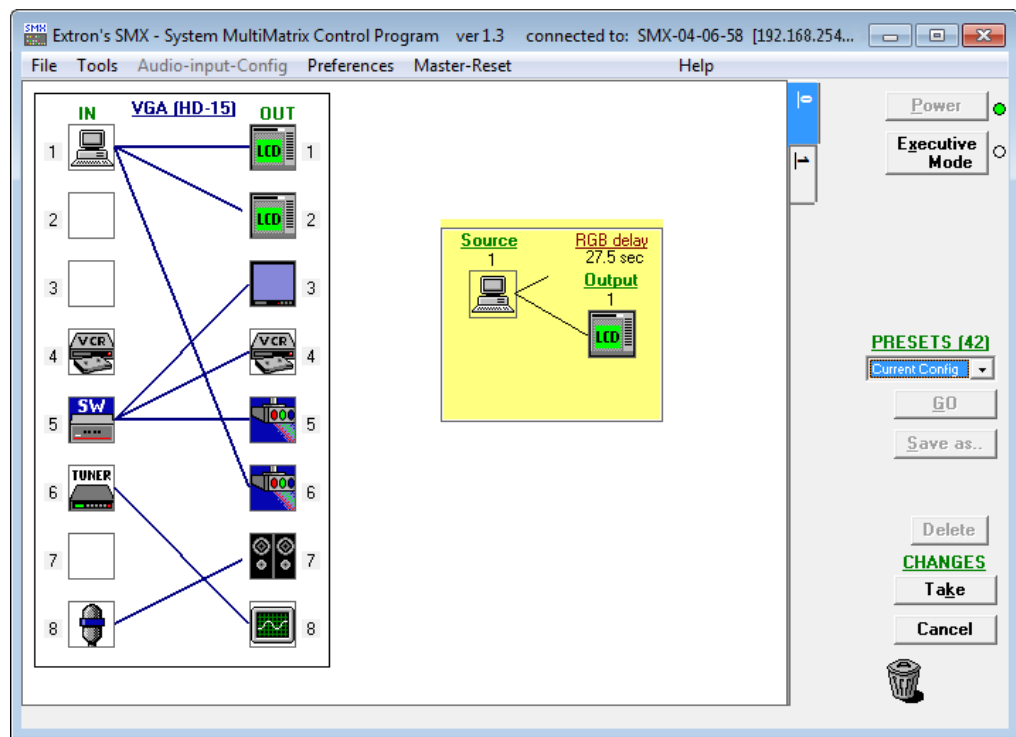


Figure 39. Matrix Window Section with Output 1 Pop-up Information

IP Settings/Options

The IP Settings/Options window (see [figure 40](#)) lets you view and, if the SMX is connected via the RS-232 or RS-422 link or if you are logged on via the Ethernet port as an administrator, edit settings unique to the Ethernet interface. None of the fields on this screen can be edited while you are logged on as a user.

To display the IP Settings/Options window, select **IP Options** from the **Tools** menu.

IP Settings / Options

Matrix IP Address : 192.168.254.254 Extron Name/Descriptor : SMX-04-06-58

Gateway IP Address : 0.0.0.0 Subnet Mask : 255.255.0.0

Hardware Address : 00-05-A6-04-06-58 ☐ Use DHCP (Obtain an IP address automatically)

Date : Fri, 13 May 2011 Time (local) : 10:16:32 Sync time to PC GMT : -08:00 ☒ Use Daylight Saving

Administrator Password : User Password :

Mail Server

IP Address : 192.168.254.35 Domain Name : anywhere.com

	E-mail Addressee	None	Fail	Fixed	Both	Missing Input(s)	Fans	Power Supply
1	Sample01@anywhere.com	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Sample02@anywhere.com	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 2 3 4 5 6 7 8

Slot 1 2 3 4 5 6

VGA (HD-15)

Send test E-mail

This PC is: 99.99.9.999 (JSMITH) Cancel Take

Figure 40. IP Setting/Options Window

NOTES: • Editing the following fields on the IP Settings/Options window while the SMX is connected via the Ethernet port can immediately disconnect the computer from the unit:

Matrix IP Address, Gateway Address, Subnet Mask, Use DHCP, Administration Password.

Extron recommends editing the settings on this screen using the RS-232 or RS-422 link and protecting the Ethernet access to the screen by assigning an administrator password to qualified and knowledgeable personnel only.

- When the control program is connected to the SMX via the RS-232 or RS-422 link, the **Administrator** and **User Password** fields are not masked. If a password has been inadvertently changed to an unknown value, you can look it up and, if desired, change a password in this window without knowing the current password.

Setting the IP address

The **Matrix IP Address** field contains the IP address of the connected SMX. This value is encoded in the flash memory on the switcher.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

Edit the address field as follows:

1. Click in the **Matrix IP Address** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the address.

3. Press the **Tab** key on the keyboard or click in another field to exit the **Matrix IP Address** field.
4. Click the **Take** button to make the address change take effect.

NOTE: Editing the **IP Address** field while the SMX is connected via Ethernet can immediately disconnect your from the SMX. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Setting the Extron name or descriptor

The Extron **Name/Descriptor** field contains the name used as the “from” information when the SMX e-mails notification of its failed or repaired status. The default name or descriptor shown in this field is a portion of your product name, followed by the last six characters of the unit MAC address (for example, SMX-Serie-05-A6-2D).

This descriptor can be changed to any valid name, up to 24 alphanumeric characters or hyphens.

NOTE: The following characters are invalid or not recommended in the **Extron Name/Descriptor** field: + ~ , @ = ` [] { } < > ‘ “ ” ; : | \ ? and *space*

Edit the **Extron Name/Descriptor** field as follows:

1. Click in the **Extron Name/Descriptor** field. The graphic cursor becomes a text cursor.
2. Edit the name as desired.
3. Press the **Tab** key on the keyboard or click in another field to exit the **Extron Name/Descriptor** field.
4. Click the **Take** button to make the name change take effect.

NOTE: Editing the **Gateway IP Address** field while the SMX is connected via Ethernet can immediately disconnect the PC from the SMX. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Setting the subnet mask

The **Subnet Mask** field is used to determine whether the SMX is on the same subnet as the controlling PC or the mail server when you are subnetting. The subnet mask has the same format as the matrix IP and gateway addresses (*nnn.nnn.nnn.nnn*).

For more information, see [Subnetting — A Primer](#) on page 111.

Edit this field as follows:

1. Click in the **Subnet Mask** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the mask.
3. Press the **Tab** key on the keyboard or click in another field to exit the **Subnet Mask** field.
4. Click the **Take** button to make the changes to the mask take effect.

NOTE: Editing the **Subnet Mask** field while the SMX is connected via Ethernet can immediately disconnect your PC from the SMX. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Hardware address field

The hardware (MAC) address consists of six pairs of alphanumeric characters in the format *xx-xx-xx-xx-xx-xx*. The MAC address is hard coded in the SMX and cannot be changed.

Enabling and Disabling DHCP

Selecting the **Use DHCP** check box directs the SMX to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). Contact the local system administrator for information about DHCP on your system.

NOTE: Selecting or deselecting this check box while the SMX is connected via Ethernet can immediately disconnect your PC from the unit. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Setting the date

The **Date** field displays the current date in the Greenwich Mean Time zone. If necessary, adjust the date as follows:

1. Click in the **Date** field. A date editing field appears, displaying the date in the format *(M)M/(D)D/YYYY*. Leading zeros are not used. The graphic cursor becomes a text cursor in the date editing field.
2. Edit the field as desired to set the proper date. Leading zeros are optional.
3. Press the **Tab** key on the keyboard or click in another field to exit the **Date** field.
4. Click the **Take** button to make the date change take effect.

Setting the local time

The **Time (local)** field displays the current time in the local time zone. If necessary, click the **Sync Time to PC** button to set the SMX to the internal time of your computer, or adjust the time manually as follows:

1. Click in the **Time (local)** field. A time editing field appears with the date in the format *HH:MM:SS (00:00:00 to 23:59:59)*. The graphic cursor becomes a text cursor in the time editing field.
2. Edit the field as desired to set the proper time. Remember to use 24-hour time. Leading zeros are optional.
3. Press the **Tab** key or click in another field to exit the **Set Time** field.
4. Click the **Take** button to make the time change take effect.

Sync time to PC button

Clicking the **Sync Time to PC** button causes the computer you are operating to send its internal time to the SMX in a set time command.

Setting the offset from GMT

The **GMT** field displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference. If necessary, adjust the offset as follows:

1. Click in the **GMT** field. An offset editing field appears with the offset in the format *±HH:MM (-12:00 to +14:00)*. The graphic cursor becomes a text cursor in the set offset field.
2. Edit the field as desired to set the proper offset. Leading zeros are optional. Some time zones are on the half-hour (30 minutes).
3. Press the **Tab** key or click in another field to exit the **Set Offset** field.
4. Click the **Take** button to make the offset change take effect.

Enabling daylight savings time

When daylight savings time is enabled, the switcher updates its internal clock between daylight savings time and standard time in the spring and fall on the date that the time change occurs in your location. When daylight savings time is turned off, the SMX does not adjust its time reference.

Select the **Use Daylight Savings** check box to enable daylight savings time.

Setting the administrator password

The **Administrator Password** field displays the password required to log on to the SMX via the Ethernet port with all administrator rights and privileges.

Passwords are case sensitive and are limited to 12 uppercase and lowercase alphanumeric characters.

While you are logged on as a user, this field is masked with asterisks (*****) as a security measure.

- NOTES:**

 - The following characters are invalid or not recommended for passwords: + ~ , @ = ` [] { } < > ' " " ; : | \ ? and *space*
 - Editing the **Administrator Password** field while connected through Ethernet can immediately disconnect you from the SMX. It is recommended that you connect via RS-232/422 to edit this field.

Edit this field as follows:

1. Click in the **Administrator Password** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the case-sensitive password.
3. Press the **Tab** key on the keyboard or click in another field to exit the **Administrator Password** field.
4. Click the **Take** button to make the password change take effect.

Setting the user password

The **User Password** field displays the password required to log onto the SMX via the Ethernet port as a user, without all administrator rights and privileges. Passwords are case sensitive and are limited to 12 uppercase and/or lowercase alphanumeric characters.

While you are logged on as a user, this field is masked with asterisks (*****) as a security measure.

- NOTE:**

 - The following characters are invalid or not recommended for passwords: + ~ , @ = ` [] { } < > ' " " ; : | \ ? and *space*
 - An administrator password must be created before a user password.

Edit this field as follows:

1. Click in the **User Password** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the case-sensitive user password.
3. Press the **Tab** key on the keyboard or click in another field to exit the **User Password** field.
4. Click the **Take** button to make the password change take effect.

Setting the mail server IP address

The **Mail Server IP Address** field displays the IP address of the mail server that handles the e-mail for the facility in which the SMX switcher is installed.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeros, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

Edit this field as follows:

1. Click in the **Mail Server IP Address** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the mail server IP address.
3. Press the **Tab** key on the keyboard or click in another field to exit the **Mail Server IP Address** field
4. Click the **Take** button to make the address change take effect.

Setting the mail server domain name

The **Mail Server Domain Name** field displays the domain name that the SMX uses to log on to the e-mail server. Standard domain conventions (such as *nnnnn@xxx.com*) apply.

NOTE: The following characters are invalid or not recommended in a domain name: + ~ , @ = ` [] { } < > ' " " ; : | \ ? and *space*. The @ character is acceptable only as the lead-in to the domain name (such as *@folklore.net*).

Edit this field as follows:

1. Click in the **Mail Server Domain Name** field. The graphic cursor becomes a text cursor.
2. Edit the name as desired.
3. Press the **Tab** key on the keyboard or click in another field to exit the **Mail Server Domain Name** field.
4. Click the **Take** button to make the name change take effect.

Entering e-mail addressee information

The eight **E-mail Addressee** fields permit the administrator to identify the e-mail addresses of the personnel to whom the SMX e-mails notification of its failure and repair status (see **figure 41** for a typical e-mail message from the SMX).

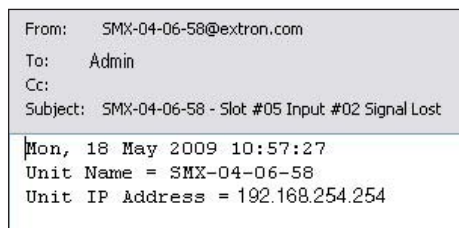


Figure 41. Typical SMX E-mail

The radio buttons and check boxes associated with each address field permit the administrator to specify e-mail requirements for each recipient.

Edit these fields and controls as follows:

1. Click in the desired **E-mail Addressee** field. The graphic cursor becomes a text cursor.
2. Edit the e-mail address as desired. Standard e-mail address conventions (such as *nnnnn@xxx.com*) apply.
3. Press the **Tab** key on the keyboard or click in another field to exit the **e-mail addressee** field.

4. Use the check boxes associated with each addressee to select the options about which the addressee will be e-mailed: missing inputs or power supply.
5. When you select either a radio button or a check box for an addressee, the floating box that contains the input numbers is displayed on the **Input Settings/Options** screen. Select the inputs that need monitoring by clicking on their numbers in this box. Selected input numbers are displayed in white on a gray field. To deselect an input number, click on it again (see [inset](#)).

6. Use the round radio buttons associated with each addressee to select whether the addressee will be e-mailed about failures, fixes, both, or not be notified. The **None** radio button temporarily removes personnel from the e-mail list when they are unavailable, in cases of traveling or being on vacation.
7. If desired, click the **Send Test E-mail** button to test the e-mail function.
8. Click the **Take** button to make the e-mail address changes take effect.

Updating the firmware

The firmware upgrade utility provides a way to replace the firmware that is coded on the SMX control board. Update the SMX firmware as follows:

NOTE: The update firmware utility is for replacing the firmware that controls all switcher operation. This is not the page to insert your own HTML pages (see [Uploading HTML Files](#) on page 85 to insert custom HTML pages).

1. Visit the Extron website, www.extron.com, and download the latest firmware file to your computer.
 - a. On the Extron website, select the **Downloads** tab.
 - b. On the **Download Center** page, click the **Firmware** link on the left sidebar menu.
 - c. Click **S** and navigate to your SMX type.
 - d. On the next screen, fill in the required information, then click the **Download product name_firmware version.exe** button.
 - e. On the File Download - Security Warning window, click **Save**.
 - f. On the Save As window, browse to the folder here you want to save the firmware file, and click **Save**. The firmware installation file is placed on your hard drive.
2. Start the SMX Control Program and connect your computer to the SMX (see [Using the Program](#) on page 62 for the procedure).

NOTE: The Ethernet connection is faster than the RS-232/RS-422 connection. Use the Ethernet connection rather than the serial port for firmware uploads.

3. From the Tools menu, select **Update Firmware...** The Select Files window opens (see [figure 42](#)).

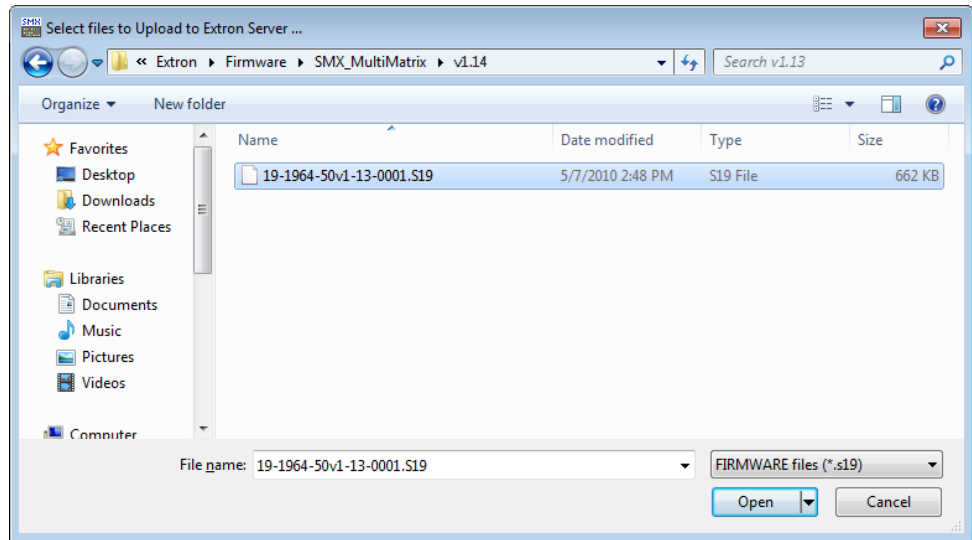


Figure 42. Select Files Window with Firmware File Selected

4. Navigate to the folder where you saved the firmware file. Select the file.

CAUTION: Valid firmware files must have the file extension .S19. Any other file extension is not a firmware upgrade and could cause the SMX to cease functioning.

NOTE: The original factory-installed firmware is permanently available on the SMX. If the attempted firmware upload fails for any reason, the SMX reverts to the factory-installed firmware.

5. Click **Open**. A confirmation prompt window opens, reminding you that loading the selected .S19 file will reprogram the device firmware.
6. Click **OK** to continue with upload. A status window, which shows the progress of the upload, appears. The firmware upload to the SMX may take a few minutes.
7. When the upload is complete, another prompt window appears, informing you that the new firmware upgrade will cause the SMX to reset, which will terminate the connection with your computer and close the control software. Click **OK**.

If you want to continue using the **SMX Control Program**, restart it.

Uploading HTML files

You can create customized HTML pages for the SMX to display. The HTML Files List window (see [figure 43](#)) provides a way to view the contents of the SMX file system and to upload custom HTML pages to the SMX.

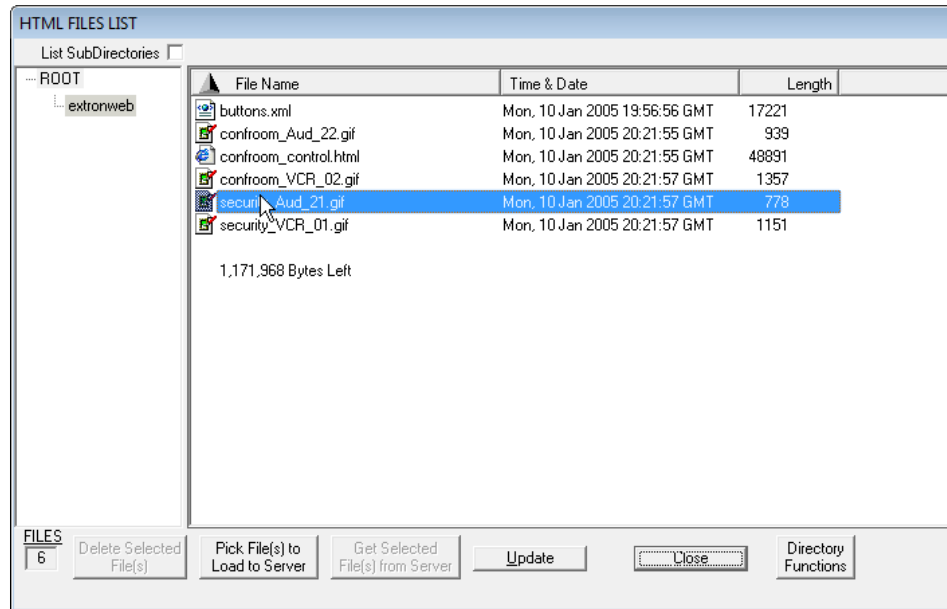


Figure 43. HTML Files List Window

Upload HTML pages as follows:

- NOTES:**
- The files listed in the figure 43 are shown for example only and may not be present on your switcher.
 - The HTML Files List window is for inserting your own HTML pages. This is not the window to replace the firmware that controls all switcher operation. To replace the firmware (see [Update firmware](#) on page 83).
 - The following characters are invalid or not recommended in file names: + ~ , A = ' [] { } < > ` “ ” ; : | \ ? and *space*

1. Connect the PC to the SMX via the switcher RS-232/RS-422 port or Ethernet port.
2. Start the **SMX Control Program** and connect to the SMX (see [Using the Program](#) on page 62 for the procedure).
3. From the **Tools** menu, select **HTML File Manager**. The HTML Files List window opens.
4. Click the **Pick File(s) to Load to Server** button. The Select files window opens.
5. Navigate to the folder where you saved the HTML files. Select the files.

- NOTES:**
- To select multiple files, hold the **Ctrl** key while clicking the desired files.
 - If you want one of the HTML files that you created to be the default start-up page, name the file “index.html.” The SMX automatically looks for that file name when first connecting to it using an Internet browser.

6. Click the **Open** button. The file uploading process may take a few minutes.
7. Click the **Update** button to confirm the upload.
8. Click the **Close** button to exit the HTML Files List window.

Windows buttons, menus, and trash can

The buttons, drop-down lists, and trash can on the right side of the program window perform the following functions:

Power — This button is unavailable for SMX switchers, because the SMX cannot be powered on and off via software.

Executive mode — Locks out front panel operations, except for the view-only mode functions.

Presets menu — Displays a list of up to 32 global presets and up to 10 plane presets. From this list you can select a global or plane preset to display in the window, then either activate the selected preset by clicking **Go** or delete it by clicking **Delete**.

Go — Activates the selected preset as the current configuration.

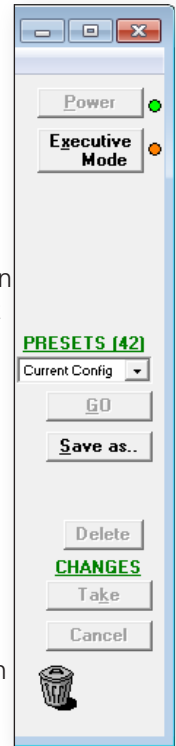
Save as — Saves the current set of ties as a global or plane preset. Enter a preset number for it when prompted to do so.

Delete — Deletes the selected global or plane preset to be deleted.

Take — Saves to file any changes made to the displayed configuration.

Cancel — Returns to the previous screen, undoing any changes you have made.

Trash can — Drag and drop from an input or output button to the trash can to undo all ties associated with that input or output.



HTML Configuration and Control

The SMX can be configured and controlled through its Ethernet port, connected through a LAN or WAN and accessed with a web browser such as Microsoft Internet Explorer. The browser displays the factory-installed web pages, which provide an alternative means of viewing and controlling the SMX. This section includes:

- [Accessing the Web Pages](#)
- [System Status Pages](#)
- [Configuration Pages](#)
- [File Management Page](#)
- [Control Pages](#)

NOTE: If your Ethernet connection to the SMX is unstable, try turning off the proxy server in your Web browser. To do this in Microsoft Internet Explorer, click **Tools** > **Internet Options** > **Connections** > **LAN Settings**, and clear the **Use a proxy server...** check box. Click **OK**.

TIPS:

- The HTML language reserves certain characters for specific functions. The SMX does not accept these characters as part of preset names, the switcher name, passwords, or locally created file names.
- Unless otherwise specified, the following characters are not recommended or invalid for SMX inputs: + ~ , @ = ' [] { } < > " ; : | \ ? and *space*

Accessing the Web Pages

Access the HTML pages as follows:

1. Start the web browser program.
2. Click in the browser **Address** field and enter your SMX IP address (see [figure 44](#)).

NOTE: If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.

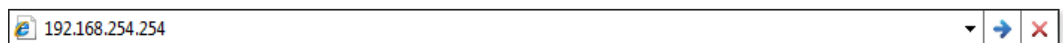


Figure 44. Internet Explorer Address Field

3. To view a non-default page instead (such as an uploaded custom page), enter a slash (/) and the name of the file to open.

NOTES:

- The browser **Address** field should display the address in the following format: *xxx.xxx.xxx.xxx/optional_file_name.html*.
- The following characters are invalid or not recommended in the file names: ~ @ = ' [] { } < > " ; : | \ ? and *space*

4. Press the <Enter> key. The SMX checks to see if it is password-protected.
If the SMX is not password-protected, the System Status web page is displayed.
If the SMX is password-protected, the network password dialog box is displayed (see [figure 45](#)).
5. In the **Password** field, enter the appropriate administrator or user password. If desired, select the check box to have the system input the password the next time you enter your SMX IP address. Click **OK**.

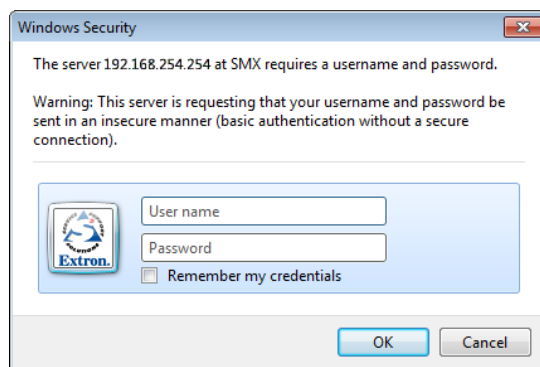


Figure 45. Example of a Network Password Dialog Box

NOTE: A **User Name** entry is not required. Some web pages may not be available or viewable only when logged in as a User.

The SMX checks several possibilities, in the following order, and responds accordingly:

- Does the address include a specific file name, such as 192.168.254.254/file_name.html? If so, the SMX downloads that HTML page.
- Is there a file in the SMX memory that is named "index.html?" If so, the SMX downloads "index.html" as the default startup page.
- If neither of the above conditions is true, the SMX downloads the factory-installed default startup page, "nortxe_index.html" (System Status page, see [figure 46](#)).

Any of the four main pages (System Status, Configuration, File Management, and Control) can be accessed at any time by clicking on the relevant tab. Each main page has a series of sub-pages, accessible through the named links in the sidebar menu.



Figure 46. System Status Page Set to the Default Home Page

System Status Pages

The System Status pages give access to sub-pages: System Status (the default page), Physical Configuration, and DVSP and HDCP. To view each individual page, click on the links in the sidebar menu.

System Status

The System Status (see [figure 47](#)) page has the following sections: System Information (such as unit name and model), Power Status, and Serial Port Settings. This read-only page updates itself periodically to reflect the latest status of the switcher components. If a variable changes, the display shows the change in status the next time it updates.

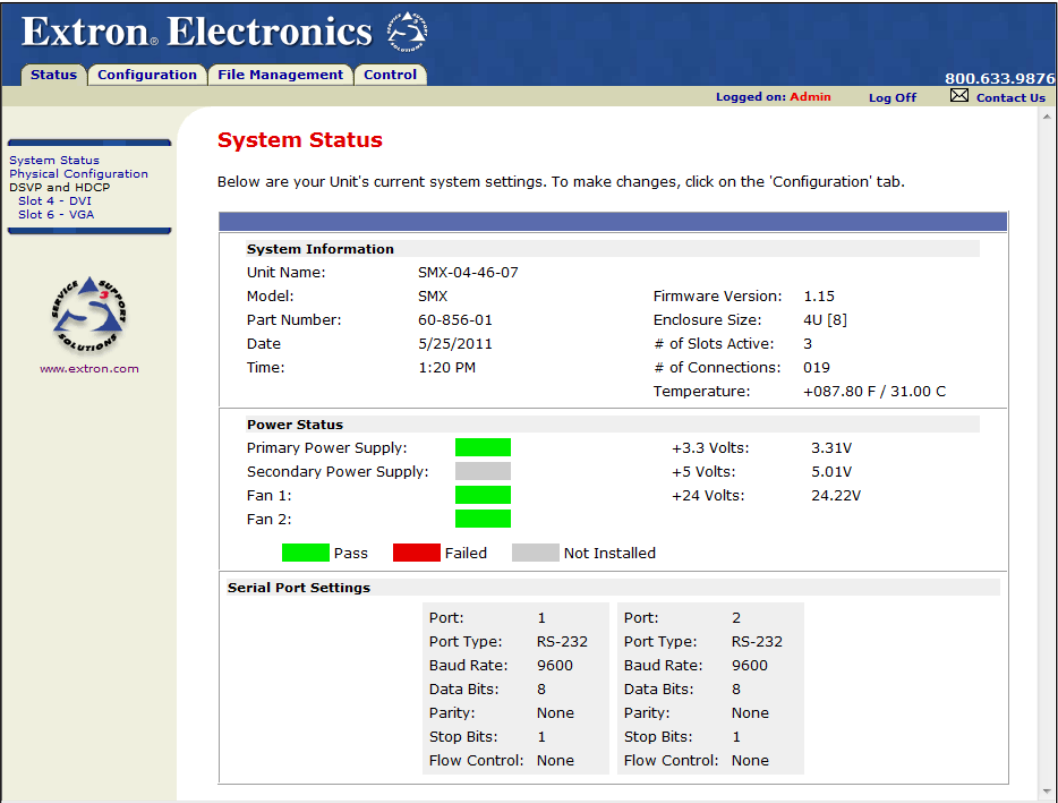
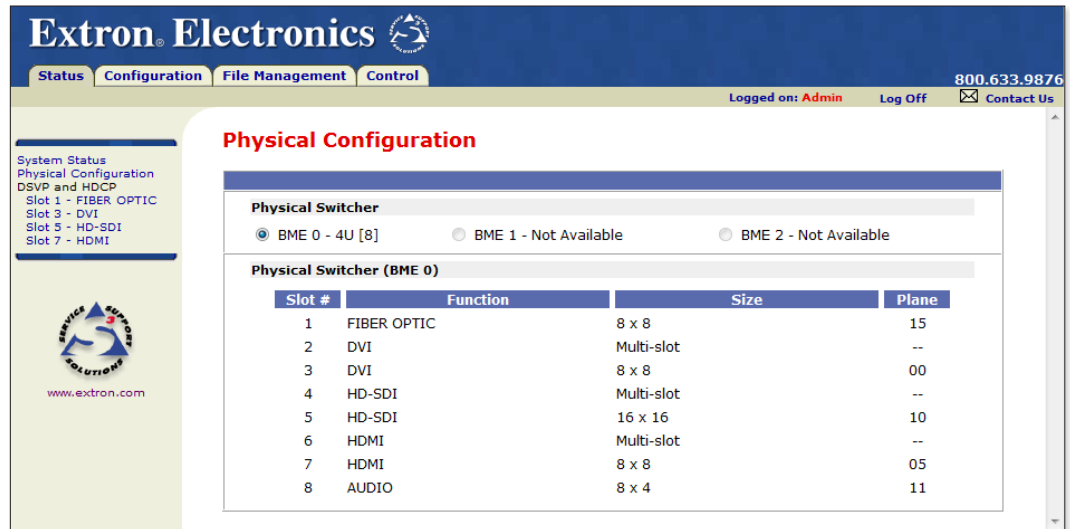


Figure 47. System Status Page

Physical Configuration

The Physical Configuration read-only page lists the currently installed boards for the SMX system, showing the size and the total slots of that frame. For each slot, it shows the installed board function or type, board size, and the plane address allocated to that board (see [figure 48](#)).



Extron Electronics

Status Configuration File Management Control

800.633.9876

Logged on: Admin Log Off Contact Us

Physical Configuration

System Status
Physical Configuration
DSVP and HDCP
Slot 1 - FIBER OPTIC
Slot 2 - DVI
Slot 3 - HD-SDI
Slot 7 - HDMI

Physical Switcher

☒ BME 0 - 4U [8] ☐ BME 1 - Not Available ☐ BME 2 - Not Available

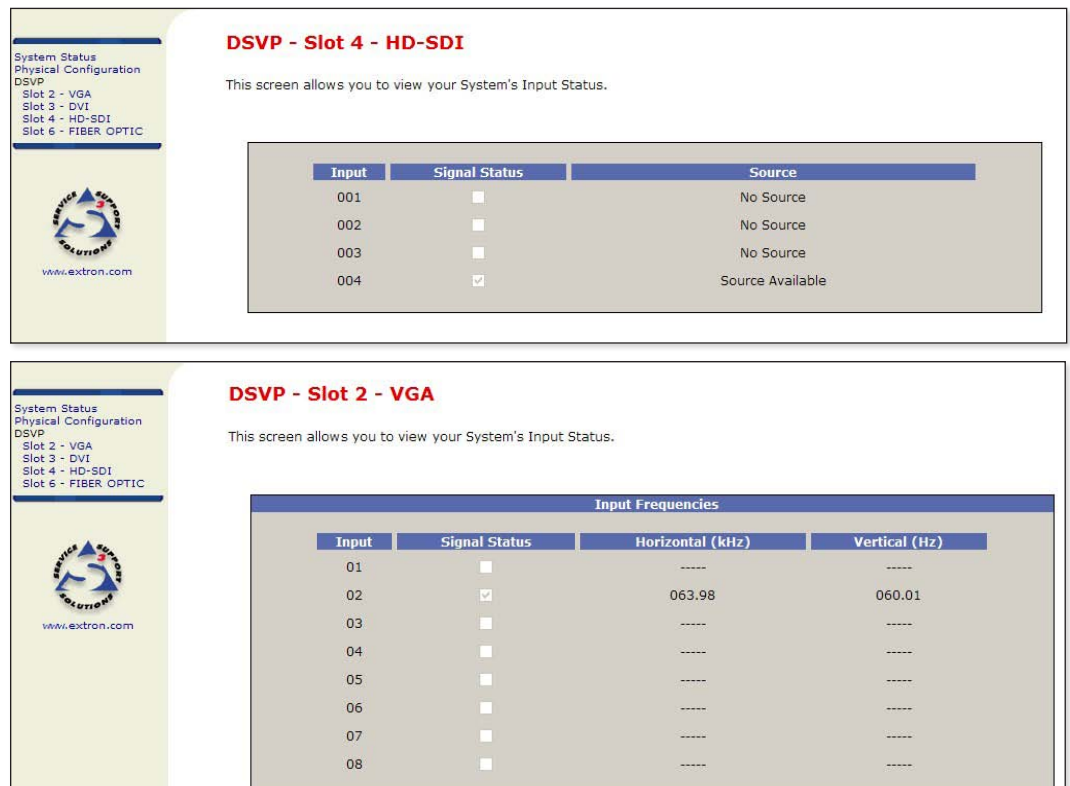
Physical Switcher (BME 0)

Slot #	Function	Size	Plane
1	FIBER OPTIC	8 x 8	15
2	DVI	Multi-slot	--
3	DVI	8 x 8	00
4	HD-SDI	Multi-slot	--
5	HD-SDI	16 x 16	10
6	HDMI	Multi-slot	--
7	HDMI	8 x 8	05
8	AUDIO	8 x 4	11

Figure 48. Physical Configuration Page

DSVP

The Digital Sync Validation Processing (DSVP) page displays the current signal status and source of connected video inputs per board. For VGA/RGBHV boards, the horizontal and vertical frequencies per slot are also shown (see [figure 49](#)).



DSVP - Slot 4 - HD-SDI

This screen allows you to view your System's Input Status.

Input	Signal Status	Source
001	<input type="checkbox"/>	No Source
002	<input type="checkbox"/>	No Source
003	<input type="checkbox"/>	No Source
004	<input checked="" type="checkbox"/>	Source Available

DSVP - Slot 2 - VGA

This screen allows you to view your System's Input Status.

Input Frequencies			
Input	Signal Status	Horizontal (kHz)	Vertical (Hz)
01	<input type="checkbox"/>	----	----
02	<input checked="" type="checkbox"/>	063.98	060.01
03	<input type="checkbox"/>	----	----
04	<input type="checkbox"/>	----	----
05	<input type="checkbox"/>	----	----
06	<input type="checkbox"/>	----	----
07	<input type="checkbox"/>	----	----
08	<input type="checkbox"/>	----	----

Figure 49. DSV Pages for HD-SDI (top) and VGA (with H and V Data)

Configuration Pages

The Configuration pages allow system settings (IP address, date/time etc.), passwords (Admin and User), and e-mail settings (mail addresses) to be configured as desired. Additionally, the current firmware can be upgraded by selecting the **Firmware Upgrade** link.

System Settings Page

The SMX displays the System Settings page (see [figure 50](#)) after selecting the **Configuration** tab. The screen consists of fields in which you can view and edit IP administration and system settings (see [Ethernet Control](#) on page 106 for basic information about IP addresses and subnetting).

Extron Electronics

Status Configuration File Management Control

Logged on: Admin Log Off Contact Us

800.633.9876

System Settings
Passwords
Email Settings
Firmware Upgrade

System Settings

Below are your Unit's basic System Settings. Most units will work with the default IP Settings without making any changes. If you require help changing your settings, please refer to the user guide.

IP Settings

Unit Name: SMX-04-46-07

DHCP: ☐ On ☒ Off

IP Address: 192.168.254.254

Gateway IP Address: 0.0.0.0

Subnet Mask: 255.255.0.0

MAC Address: 00-05-A6-04-46-07

Firmware: 1.15

Model: SMX

Part Number: 60-856-01

Submit Cancel

Date/Time Settings

Date: 5/25/2011 Local Date/Time

Time: 1:29 PM

Zone: (GMT-08:00) Pacific Time (US & Canada), Tijuana

Daylight Saving: ☐ Off ☒ USA ☐ Europe ☐ Brazil

Submit Cancel

Figure 50. System Configuration Page

On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can create ties, create and recall presets, and view all settings not password-protected.

- Ethernet connection to the switcher for entering SIS commands (see [SIS Configuration and Control](#) on page 34) or for using the SMX Control Program (see [SMX Control Software](#) on page 59), is password-protected.
- Connection via the RS-232/RS-422 port is not password-protected.

IP Settings Fields

The IP Settings section provides a location for viewing and editing settings unique to the Ethernet interface. After editing any of the settings on this page, click the **Submit** button at the bottom of the IP Settings section (see [figure 51](#)).

IP Settings	
1 Unit Name:	SMX-04-46-07
2 DHCP:	<input checked="" type="radio"/> On <input type="radio"/> Off
3 IP Address:	192.168.254.254
4 Gateway IP Address:	0.0.0.0
5 Subnet Mask:	255.255.0.0
6 MAC Address:	00-05-A6-04-46-07
7 Firmware:	1.14
8 Model:	SMX
9 Part Number:	60-856-01

Submit Cancel

Figure 51. IP Settings Fields

- ① **Unit Name field** — The **Unit Name** field contains the name used as the “from” information when the SMX e-mails notification of its failed or repaired status. You can change this name field to any valid name, up to 24 alphanumeric characters.

NOTE: The following characters are invalid or not recommended in the matrix names: + ~ , @ = ' [] { } < > “ ; : | \ ?

- ② **DHCP radio buttons** — The **DHCP On** radio button directs the switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable).

The **DHCP Off** radio button turns DHCP off. Contact the local system administrator to determine this control setting.

- ③ **IP Address field** — The **IP Address** field contains the IP address of the connected SMX. This value is encoded in the switcher flash memory.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeros, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The factory-installed default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

NOTE: IP address changes can cause conflicts with other equipment. Only local system administrators should change IP addresses.

- ④ **Gateway IP Address field** — The **Gateway IP Address** field identifies the address of the gateway to the mail server to be used if the switcher and the mail server are not on the same subnet.

The gateway IP address has the same validity rules as the system IP address.

- ⑤ **Subnet Mask field** — The **Subnet Mask** field is used to determine whether the switcher is on the same subnet as the mail server when you are subnetting (see [Subnetting — A Primer](#) on page 111).

- ⑥ **MAC Address field** — The Media Access Control (MAC) Address is hard coded in the switcher and cannot be changed.

- ⑦ **Firmware field** — This field shows the firmware version number. This field only changes when the firmware is updated.

- ⑧ **Model field** — This field shows the model (SMX) and cannot be changed.

- ⑨ **Part Number field** — This field shows the SMX part number (60-856-01) and cannot be changed.

Date/Time Settings fields

The Date/Time Settings section (see [figure 52](#)) provides a location for viewing and setting the time functions.

The screenshot shows a web-based configuration interface for date and time settings. The interface is titled 'Date/Time Settings'. It features several input fields and buttons. The 'Date' field has three dropdown menus for day (7), month (12), and year (2009). The 'Time' field has three dropdown menus for hour (1), minute (40), and AM/PM (AM). The 'Zone' field is a dropdown menu showing '04:00 Atlantic Time (Canada), Caracas, La Paz, Santiago'. The 'Daylight Saving' field has three radio buttons: USA, Europe (selected), and Brazil. There are 'Local Date/Time', 'Submit', and 'Cancel' buttons. A vertical scroll bar is visible on the left side of the form.

Figure 52. Date/Time Settings Fields

Change the date and time settings as follows:

1. Click the drop-down box for the desired variable. The adjustable variables are month, day, year, hours, minutes, am/pm, and (time) zone (see [figure 52](#)).
2. Click the scroll up or down buttons until the desired variable is visible.
3. Click on the desired variable.

NOTES:

- If setting the time, set the local time. The **Zone** variable allows you to then enter the offset from Greenwich Mean Time (GMT).
- The **Zone** field identifies the standard time zone that has been selected and displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.

4. Repeat steps **1** through **3** for other variables that need to be changed.
5. Select the appropriate **Daylight Saving** radio button. To turn off daylight savings time, select **Off**.

NOTE: When daylight savings time is enabled, the switcher updates its internal clock between Standard Time and Daylight Savings Time in the spring and fall on the date that the time change occurs in the United States of America and parts of Europe and Brazil. When daylight savings time is turned off, the switcher does not adjust its time reference.

6. Click the **Submit** button at the bottom of the Date/Time Settings section to implement the selections.

Passwords Page

Access the Passwords page (see [figure 53](#)) by clicking the **Passwords** link on the sidebar menu on System Settings page.

Extron Electronics

Status Configuration File Management Control

Logged on: Admin Log Off Contact Us

800.633.9876

Passwords

To update the Administration Password, enter the desired password, repeat the entry, and press 'Submit'. To update the User Password, enter the desired password, repeat the entry, and press 'Submit'. To clear a password, enter a single space, repeat the entry, and press 'Submit'. Minimum password length is 4 characters. Maximum password length is 12 characters. Passwords are case sensitive and special characters are not allowed.

Passwords

Administrator Password: Re-enter Admin Password:

User Password: Re-enter User Password:

Submit Cancel

Figure 53. Passwords Page

The fields on the Passwords page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to 12 upper- and lowercase alphanumeric characters. Each password must be entered twice—once in the **Password** field and then again in the **Re-enter Password** field to the right. Characters in these fields are masked by four bullets (••••). If you do not want to password-protect an access level, leave the **Password** and the **Re-Enter Password** fields blank. After entering the desired password in both fields, click the **Submit** button at the bottom of the page.

- NOTES:**
- An administrator password must be created before a user password.
 - Some web pages may not be available or may be viewable only, when logged in as a User.

To clear an existing password so that no password is required, delete the bullets in the **Password** and **Re-enter Password** fields and enter a space in each field, then click the **Submit** button at the bottom of the page.

Email Settings Page

The Email Settings page has fields for setting up the SMX e-mail notification capabilities. For each row of the e-mail notification settings, click the **Edit** button at the right of the field to make the field available for editing. The button changes to **Save**. After editing the settings associated with the **Edit/Save** button, click the **Save** button.

Extron Electronics

Status Configuration File Management Control

Logged on: Admin Log Off Contact Us

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Email Settings

Email Settings

Mail IP Address: 10.1.5.5 Edit

Domain Name: extron.com

☒ SMTP Authentication Required

User Name:

Password:

Email Address	Slot #	Missing Input	Fans	Power	Email Options
1. acer@extron.com	6 - VGA	All <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Both Failure/Fixed Edit

Figure 54. Email Settings Page (Upper Portion)

- ① **Mail IP Address field** — The **Mail IP Address** field displays the IP address of the mail server that handles the e-mail for the facility.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

- ② **Domain Name field** — The **Domain Name** field displays the domain name that the SMX uses to log on to the e-mail server. Standard domain name conventions (for example, *nnnnn@xxx.com*) apply.

NOTES:

- The following characters are invalid or not recommended in the domain names: + ~ , @ = ' [] { } < > " ; : | \ ? and *space*
- The @ character is acceptable only as the lead-in to the domain name (such as *@folklore.net*).

- ③ **SMTP Authorization Required check box** — The **SMTP Authorization Required** check box sets the SMX to require SMTP authorization before accepting any e-mail. To set up this authorization requirement, follow these steps:

1. To enable the **SMTP Authorization** fields, click the **Edit** button at the right of the **Mail IP Address** field. The **Edit** button changes to **Save**.
2. Select the **SMTP Authorization Required** check box, located below the **Domain Name** field. This enables the **User Name** and **Password** fields below the check box.
3. In the **User Name** and **Password** fields, enter a user name and a password that senders must enter in order for the SMX to accept their e-mail messages.

For the **User Name**, use any combination of letters, numerals, spaces, and symbols except the comma (,) and the single and double quotation marks (' and "). For the password, you can use all characters except the comma. The user name and password can each be from 1 to 30 characters.

NOTE: You must specify both a user name and a password.

4. Click the **Save** button next to the **Mail IP Address** field to save your user name and password.

To remove SMTP authorization, click **Edit**, deselect the **SMTP Authorization Required** check box, then click **Save**.

Email Address Fields

The eight **Email Address** fields identify the e-mail addresses of the personnel to whom the SMX e-mails notification of its failure and repair status. Standard e-mail address conventions (*nnnnn@xxx.com*) apply.

The check boxes and drop boxes associated with each address field let you specify criteria under which the SMX will e-mail the recipients.

Click **Edit** to make changes. Click **Save** to save the changes (see [figure 55](#)).

- In the **Missing Input** drop-down list to the left of the address, select the inputs to monitor for presence or absence of a signal.
- Check the **Power** box to monitor the power supplies.
- In the associated **Email Options** drop-down list, select whether the recipient is to be e-mailed of failures, fixes, both, not notified, or removed from the e-mail list.

Email Address	Slot #	Missing Input	Fans	Power	Email Options
1. test@yourworks.com	2 - VGA	All <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/> Save
2. <input type="text"/>	2 - VGA	All <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/> Edit

Input #4
 Input #5
 Input #6
 Input #7
 Input #8

Input #1
 Input #2
 Input #3
 Input #4
 Input #5

Input #1

Figure 55. Email Options Menu on the Email Settings Page

The **Suspend** option is useful for temporarily removing personnel from the e-mail list when they are unavailable, such as traveling or vacation. Deleting an e-mail addressee and clicking the **Save** button removes the recipient from e-mail notification completely.

Firmware Upgrade Page

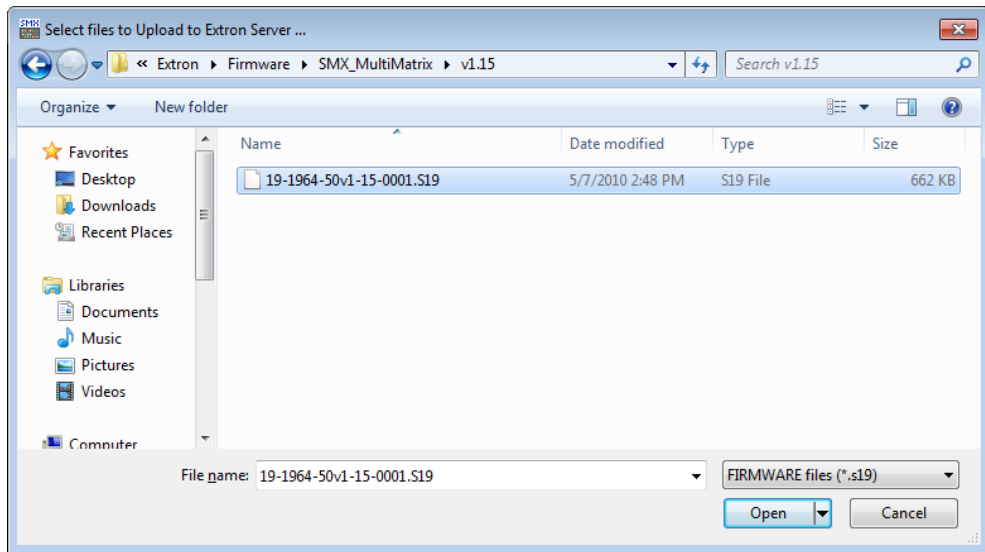
The Firmware Upgrade page (see [figure 56](#)) provides a way to replace the firmware that is coded on the SMX control board without needing to take the switcher out of service.

Figure 56. Firmware Upgrade Page

NOTE: The Firmware Upgrade page is only for replacing the existing firmware. To insert custom HTML pages (see [File Management Page](#) on page 97).

Update the SMX firmware as follows:

1. Visit the Extron website, www.extron.com, and download the latest firmware file.
 - a. On the Extron web page, select the **Downloads** tab.
 - b. On the Download Center page, click the **Firmware** link on the left sidebar menu.
 - c. Click on the name of your SMX .
 - d. On the next screen, fill in the required information, then click the **Download product name_firmware version.exe** button.
 - e. On the File Download - Security Warning window, click **Save**.
 - f. On the Save As window, browse to the folder where you want to save the firmware file, and click **Save**.
2. Access the SMX web pages.
3. Select the **Configuration** tab.
4. On the Configuration page, click the **Firmware Upgrade** link on the left sidebar menu.
5. Click the **Browse** button. A Choose File window opens.
6. Navigate to the folder where you saved the firmware upgrade file. Select the file.



CAUTION: Valid firmware files must have the file extension “.S19.” Any other file extension is not a firmware upgrade and could cause the SMX to cease functioning.

NOTE: The original factory-installed firmware is permanently available on the SMX. If the attempted firmware upload fails for any reason, the SMX reverts to the factory-installed firmware.

7. Click **Open**.
8. On the Firmware Upgrade page, click the **Upload** button. While the firmware is uploading, the **Upload** button changes to **Uploading...** When the uploading process is complete, the button changes back to **Upload**. The process may take a few minutes.

File Management Page

This page allows you to upload or delete user files (such as HTML pages and bitmaps) from the SMX (see [Uploading HTML files](#) on page 85 for another method of uploading files).

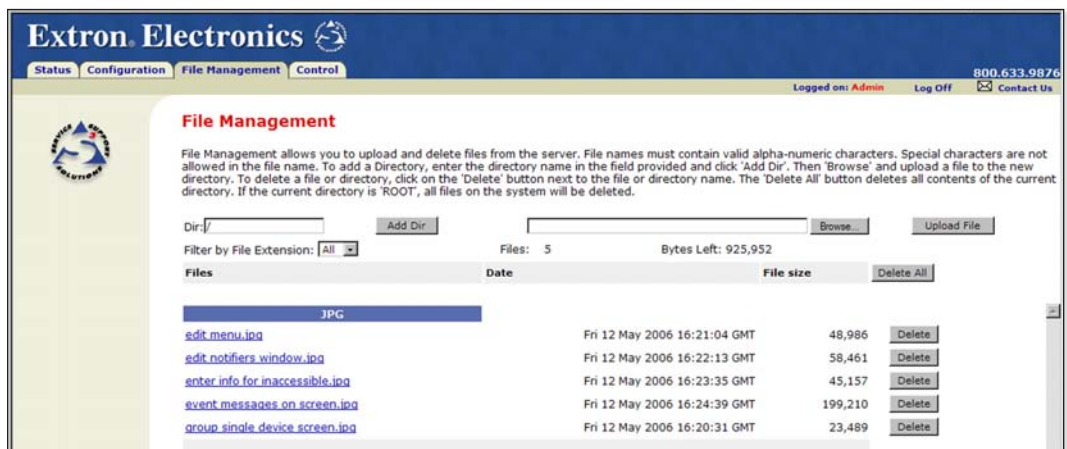


Figure 57. File Management Page

NOTE: The files listed in the figure above are shown for example only and may not be present on your SMX.

Uploading Files

Files to be uploaded may only contain valid alphanumeric characters and underscores.

NOTE: The following characters are invalid or not recommended in the files names: + ~ , @ = ' [] { } < > " ; : | \ ? and *space*

To upload files from the server, follow these steps:

1. Click the **Browse** button to the right of the file name field.
2. Browse to locate the file that you want to upload, and open it. The name and directory path of the file are displayed in the file name field on the File Management screen.
3. Click the **Upload File** button. The selected file name appears in the **Files** column (files are listed separately under headings of their extensions).

NOTE: If you want one of the pages that you create and upload to be default startup page, name that file "index.html."

Adding a Directory

To add a directory or folder to the SMX file system, follow these steps:

1. Enter the directory name in the **Dir:** field, following the slash (/).
2. Click the **Add Dir** button.
3. With the directory name displayed, perform the **Uploading HTML files** procedure on page 85 to add a file to the directory. The directory name appears at the top of the **Files** column, preceded by a slash.

To add more files to the directory, click the directory name to open it, then use the uploading files procedure. To exit the directory, click **(root)** or **(back)**.

Other File Management Activities

You can also perform the following tasks on the File Management screen:

Open a file — Click on the name of the file in the **Files** column.

Delete a file — Click the **Delete** button in the row of the file to be removed.

Delete All files — Click the **Delete All** button to delete all files.

Display files by file extension — The **Filter by File Extension** menu lists the extensions of the files that have been uploaded to the SMX. This menu lets you choose to display only files with the extension you select. Select **All** to display all uploaded files.

Control Pages

The Control pages allow limited device configuration. From the User Control page, setting and viewing of input-to-output ties, viewing and adjustment of input audio levels, output volume levels, muting status, and the configuring and saving of EDID data are possible across all allocated plane addresses. The Preset page allows global and plane presets to be saved and recalled.

User Control Page

The User Control page emulates some of the front panel features and displays the current input-to-output ties, input audio level, output volume, A/V mute status, and current EDID settings (see **figure 58**). See **Operation** on page 13 for additional descriptions.

To Set or Replace Ties

1. Select the desired plane from the drop-down list (see [figure 58](#)).

NOTE: When you select a plane, only the available adjustment fields show on the screen, according to the output board type installed and addressed.

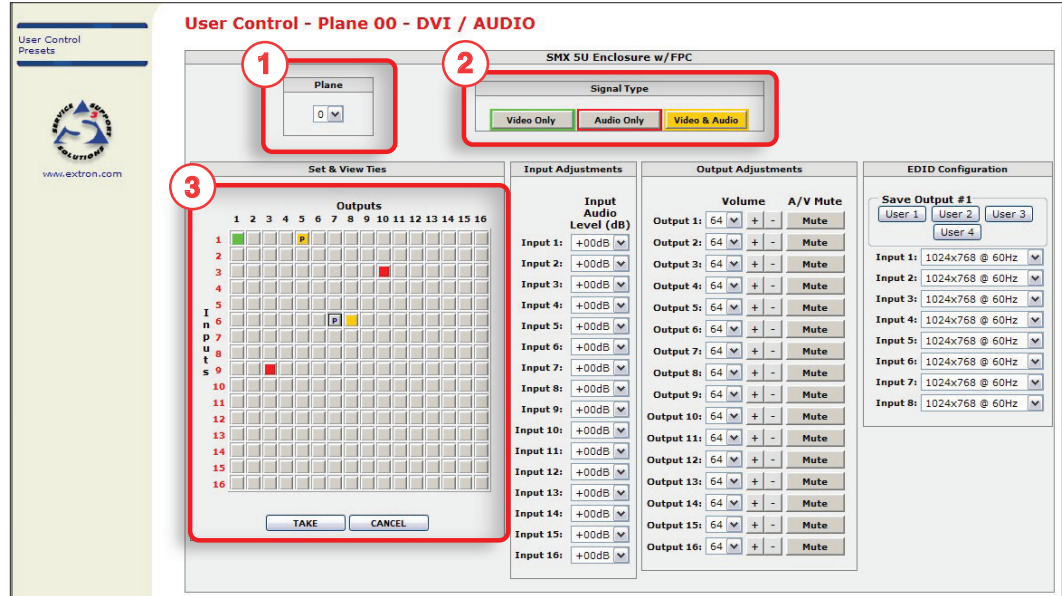


Figure 58. Control Pages — User Control Page

2. In the Signal Type section, click **Video only**, **Audio only**, or **Video & Audio**, depending on the signal type to be tied.

NOTE: When viewing the ties on the User Control page, video ties are shown green, audio ties are red, and video and audio ties amber (see [figure 58](#)).

3. Click the desired input or output button in the Set & View Ties map. The button changes color according to signal type and indicates a provisional tie with a letter “P” (see [figure 58](#), input 6, output 7, for example).

NOTE: An existing tie to an input is replaced by the new input tie. Click **Cancel** to abandon changes and revert back to the existing ties.

4. Click **Take** to make the ties. The page refreshes, the letter “P” disappears from the button and the SMX is updated with the new tie.

To Remove Ties

1. Select the desired plane from the drop-down list.
2. In the Signal Type section, click **Video only**, **Audio only**, or **Video & Audio**, depending on the signal type to be removed.
3. Click the input or output button of the tie to be removed. The button changes color and indicates a provisional tie with a letter “P” (see [figure 58](#)).

- NOTES:**
- If a video tie is removed from a video and audio tie, the button turns red (from amber).
 - If an audio tie is removed from a video and audio tie, the button turns green (from amber).
 - If a single signal tie (video or audio) is removed, or there is a combined signal (the Video & Audio signal type button is highlighted), the Video Only or Audio Only button turns gray (see [figure 58](#), input 6, output 7).

4. Click **Take** to make the tie. The screen refreshes, the letter “P” disappears from the button, and the SMX is updated, removing the selected tie.

To set input audio levels

1. In the Input Adjustments section, click in the desired input audio level field. A drop-down list of dB values (+24 to -18 dB) appears (see [figure 59](#), input 4).

The screenshot shows the 'Input Adjustments' section of a configuration interface. It features a table with 16 rows, each representing an input channel. The first column lists the inputs from 'Input 1:' to 'Input 16:'. The second column, titled 'Input Audio Level (dB)', contains a drop-down menu for each input. For 'Input 4:', the drop-down menu is open, displaying a list of dB values from +11dB to -18dB. The values are: +11dB, +10dB, +09dB, +08dB, +07dB, +06dB, +05dB, +04dB, +03dB, +02dB, +01dB, +00dB, -01dB, -02dB, -03dB, -04dB, -05dB, -06dB, -07dB, -08dB, -09dB (which is highlighted), -10dB, -11dB, -12dB, -13dB, -14dB, -15dB, -16dB, -17dB, and -18dB. A vertical scrollbar is visible on the right side of the list.

Input	Input Audio Level (dB)
Input 1:	+09dB
Input 2:	+05dB
Input 3:	+00dB
Input 4:	-09dB
Input 5:	+11dB
Input 6:	+10dB
Input 7:	+09dB
Input 8:	+08dB
Input 9:	+07dB
Input 10:	+06dB
Input 11:	+05dB
Input 12:	+04dB
Input 13:	+03dB
Input 14:	+02dB
Input 15:	+01dB
Input 16:	+00dB
	-01dB
	-02dB
	-03dB
	-04dB
	-05dB
	-06dB
	-07dB
	-08dB
	-09dB
	-10dB
	-11dB
	-12dB
	-13dB
	-14dB
	-15dB
	-16dB
	-17dB
	-18dB

Figure 59. Drop-down List of dB Values

2. Scroll down to the desired level and click. The page refreshes and the device updates to the selected level.

To set output volume levels

1. In the Output Adjustments section, click in the desired output volume field. A drop-down list of volume settings (0 to 64) appears (see [figure 60](#), output 6).

	Volume			A/V Mute
Output 1:	39	+	-	Mute
Output 2:	64	+	-	Mute
Output 3:	44	+	-	Mute
Output 4:	64	+	-	Mute
Output 5:	64	+	-	Mute
Output 6:	21	+	-	Mute
Output 7:	22	+	-	Mute
Output 8:	23	+	-	Mute
Output 9:	24	+	-	Mute
Output 10:	25	+	-	Mute
Output 11:	26	+	-	Mute
Output 12:	27	+	-	Mute
Output 13:	28	+	-	Mute
Output 14:	29	+	-	Mute
Output 15:	30	+	-	Mute
Output 16:	31	+	-	Mute

Figure 60. Drop-down List of Volume Settings

2. Scroll down to the desired level and click. The page refreshes and the device updates to the selected level.

NOTE: Alternatively, use the + and – buttons to increase or decrease the level one step at a time. The page refreshes and the device updates every time the buttons are clicked on.

To mute or unmute a signal

1. In the Signal Type field (see ②, [figure 58](#)), click **Video only**, **Audio only**, or **Video & Audio**, depending on the signal type to be muted.

Output Adjustments				
	Volume	A/V Mute		
Output 1:	39 ▼ + -	Mute		
Output 2:	64 ▼ + -	Muted		
Output 3:	44 ▼ + -	Muted		
Output 4:	64 ▼ + -	Mute		
Output 5:	64 ▼ + -	Muted		
Output 6:	21 ▼ + -	Muted		
Output 7:	64 ▼ + -	Muted		
Output 8:	64 ▼ + -	Muted		
Output 9:	64 ▼ + -	Mute		
Output 10:	64 ▼ + -	Mute		
Output 11:	64 ▼ + -	Mute		
Output 12:	64 ▼ + -	Mute		
Output 13:	64 ▼ + -	Mute		
Output 14:	64 ▼ + -	Muted		
Output 15:	64 ▼ + -	Mute		
Output 16:	64 ▼ + -	Mute		

Figure 61. A/V Mute Button Status

2. In the Output Adjustment section, click **Mute** to mute the output. The button changes color according to the muted signal (see the [Note](#) below and [figure 61](#)), and changes to **Muted**. The page refreshes and the SMX updates with the selection.

- NOTES:**
- If the output is muted for audio, the button is red.
 - If the output is muted for video, the button is green.
 - If the output is muted for video and audio, the button is amber.

EDID configuration

1. In the Plane section, select the plane that has an EDID-supporting output board installed.
2. In the EDID Configuration section, click the applicable Input number and scroll down to the resolution and refresh rate desired (see [figure 62](#), input 7).

NOTE: The drop-down list has 41 selections (see the [EDID table](#) on page 41).

The screenshot shows the 'EDID Configuration' window. At the top, there are four buttons: 'User 1', 'User 2', 'User 3', and 'User 4'. Below these, there are eight input selection boxes labeled 'Input 1' through 'Input 8'. Each box currently displays '1024x768 @ 60Hz'. The 'Input 8' box is selected, and its dropdown menu is open, showing a list of 41 options. The options include various resolutions and refresh rates such as '800x600 @ 60Hz', '1024x768 @ 60Hz', '1365x768 @ 60Hz', and '1600x1200 @ 60Hz'. The option '1365x768 @ 60Hz' is currently highlighted in the list.

Figure 62. EDID Configuration Settings

3. If using **User Assigned 1 - 4**, click one of the **Save Output 1 User** button (1-4) as desired. The DDC data is saved under the User Assigned number for recall.
4. To save an EDID setting to a user assignable number (User Assigned 1 through 4), connect the monitor (that you want the EDID data for) to Output 1 only and turn on the monitor.
5. Press a User button to save the data. The saved data can be recalled later.

Presets Page

The Presets page allows global and plane presets to be saved to one of 32 locations for global presets, or to one of the 10 locations for plane presets.

NOTE: Global presets save and recall configurations for all planes, and plane presets save and recall configurations for a specific plane, not affecting other planes.

Saving the Current Configuration as a Global Preset

1. In the Global Presets section, click **Save Preset**. The button changes to **Select Preset...**, and grays out.

NOTE: All unassigned buttons become active. The plane preset field grays out.

2. Select the desired preset by clicking one of the preset buttons.
 - To create a new preset, click one of the **[unassigned]** buttons.
 - To overwrite an existing preset, click its button.
3. Enter a name for the preset in the text field.

NOTES:

- Preset names are limited to 12 characters. Valid characters are 0 - 9, a - z, A - Z, _ : = / and space
- The following characters are invalid or not recommended in the matrix names: + ~ , @ = ' [] { } < > " ; : | \ ?

4. Click the **Accept** button.

If you do not rename an unassigned button, the SMX names the preset as Preset *nn* (where *nn* corresponds to the next global preset number).

The SMX retains the same preset name if it is not renamed when it is overwritten.

Recalling a Global Preset

To recall a global preset as the current configuration, click the button for the desired preset in the Global Presets section.

Saving the Current Configuration as a Plane Preset

1. In the Plane Preset section, click the plane drop-down list, and select the relevant plane.
2. Click **Save Preset**. The button changes to **Select Preset...**, and grays out.

NOTE: All unassigned buttons become active. The global preset field grays out.

3. Select the desired preset by clicking one of the preset buttons.
 - To create a new preset, click one of the **[unassigned]** buttons.
 - To overwrite an existing preset, click its button.
4. Enter a name for the preset in the text field.

NOTES:

- Preset names are limited to 12 characters. Valid characters are 0 - 9, a - z, A - Z, _ : = / and *space*
- The following characters are invalid or not recommended in the matrix names: + ~ , @ = ' [] { } < > " ; : | \ ?

5. Click **Accept**.

If you do not rename an unassigned button, the SMX names the preset as **Preset *nn*** (where *nn* corresponds to the next plane number).

The SMX retains the same preset name if it is not renamed when it is overwritten.

Recalling a Plane Preset

To recall a plane preset as the current configuration, on the Plane Presets page, select the relevant plane, then click the button for the desired preset.

Ethernet Control

This section describes Ethernet connection and Telnet communication to the SMX and includes:

- [Ethernet Link](#)
- [Subnetting — A Primer](#)

Ethernet Link

The rear panel Ethernet connector on the SMX can be connected to an Ethernet LAN or WAN. This connection makes SIS control of the SMX possible using a computer connected to the same LAN.



Ethernet Connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see [figure 63](#)).

- **Crossover cable** — Direct connection between the computer and the SMX.
- **Patch (straight) cable** — Connection of the SMX switcher to an Ethernet LAN.

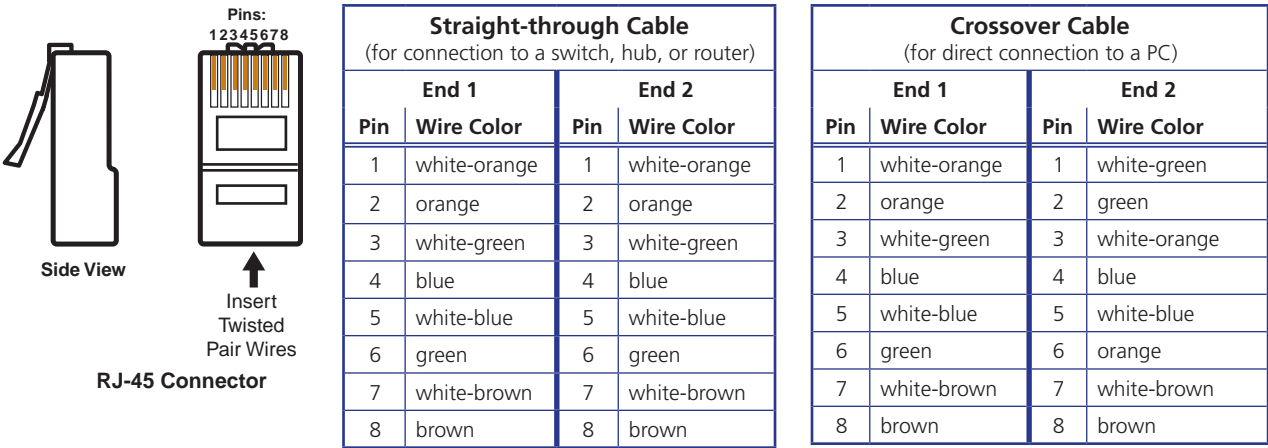


Figure 63. RJ-45 Connector Pinout Tables

Default Address

To access the SMX via the Ethernet port, you need the SMX IP address. If the address has been changed to an address comprised of words and characters, the actual numeric IP address can be determined using the Ping utility. If the address has not been changed, the factory-specified default is 192.168.254.254.

Ping can also be used to test the Ethernet link to the SMX.

Ping to determine Extron IP address

The Microsoft Ping utility is available at the DOS prompt. Ping tests the Ethernet interface between the computer and the SMX. Ping can also be used to determine the actual numeric IP address from an alias and to determine the web address.

Ping the SMX as follows:

1. From the Windows Start menu, select **All Programs > Accessories > Command Prompt**. The DOS Command window opens.

NOTES: The command prompt can also be accessed from the **Run...** field.

- For Windows 7, click the Windows **Start** menu, and enter **cmd** in the **Search Programs and Files** field. Select **Cmd** from the list.
- For older Windows operating systems, click the Windows **Start** menu and select **Run...** In the Run window, enter **command** in the **Open** field and click **OK**.

3. At the DOS prompt, enter `ping <IP address>`. The computer returns a display similar to **figure 64**.
4. The **Pinging...** line reports the actual numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

```
C:\>ping 192.168.254.254

Pinging 192.168.254.254 with 32 bytes of data:

Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.254.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milliseconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 64. Ping Response

Ping to determine web IP address

The Ping utility has a modifier, **-a**, that directs the command to return the web address rather than the numeric IP address.

At the DOS prompt, enter `ping -a IP address`. The computer returns a response similar to the Ping response shown in **figure 64**, except that when you specify the **-a** modifier, the **Pinging mail...** line reports the web IP address instead of the numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

Configuring the SMX for Network Communication

To function together, both the PC and the SMX must be configured correctly. The PC must be network-capable with the proper protocols, and the SMX must be set up so it can be connected to a LAN or other network.

When powering the SMX on for the first time, set up the IP address one of these ways:

- Use the SMX Control Program software via the LAN connector.
- Use the ARP (address resolution protocol) command via the LAN connector.
- Use a web browser via the LAN connector.
- Use SIS commands via Telnet and the LAN connector.

If you use a web browser or Telnet the first time you connect a PC to an SMX via IP, you may need to temporarily change the IP settings of the PC in order to communicate with the switcher. Then you must change the switcher default settings (IP address, subnet mask, and [optional] administrator name and password) in order to use the unit on an intranet (LAN) or on the Internet. After you have set up the SMX for network communication, you can reset the PC to its original network configuration.

SMX LAN port defaults:

- **SMX IP address:** 192.168.254.254
- **Gateway IP address:** 0.0.0.0
- **Subnet mask:** 255.255.0.0
- **DHCP:** off
- **Link speed and duplex level:** autodetected

NOTE: Both the computer and the SMX must be connected to the same subnet on a LAN (using a straight-through cable). Alternatively, you can use a crossover Ethernet cable to connect the controller directly to the computer Ethernet card.

The following instructions assume that you have already connected the PC to the SMX LAN port and powered on the controller and the PC.

Configuring the SMX for Network Use Via the ARP Command

The ARP (address resolution protocol) command tells your computer to associate the SMX MAC (media access control) address with the assigned IP address. You must then use the ping utility to access the SMX, at which point the SMX IP address is reconfigured.

Use ARP to configure the IP address as follows:

1. Obtain a valid IP address for the SMX from your network administrator.
2. Obtain the SMX MAC address (UID number) from the label on its rear panel. The MAC address should have this format: 00-05-A6-xx-xx-xx.
3. If the SMX has never been configured and is still set for factory defaults, go to step 4. If not, perform a Mode 4 system reset. For detailed information on reset modes (see [Using Reset Levels](#) on page 32).
4. At the PC, access the MS-DOS command prompt, then enter the `arp -s` command. Type in the desired new IP address for the unit and the unit MAC address. For example:
`arp -s 10.13.197.7 00-05-A6-03-69-B0`

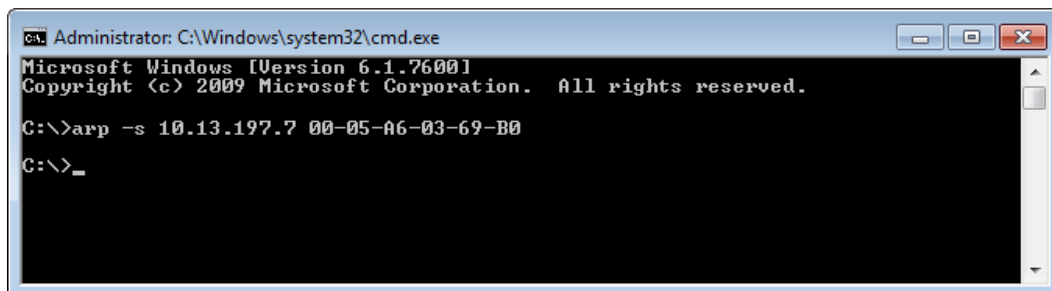


Figure 65. ARP Command

NOTE: The MAC address is listed on the rear panel.

After the `arp -s` command is issued, the SMX changes to the new address and starts responding to the ping requests, as described in the next step.

5. Execute a ping command by entering `ping` followed by a space and the new IP address at the command prompt. For example:

`ping 10.13.197.7`

You must ping the SMX in order for the IP address change to take place. The response should show the new IP address, as shown in the following picture.

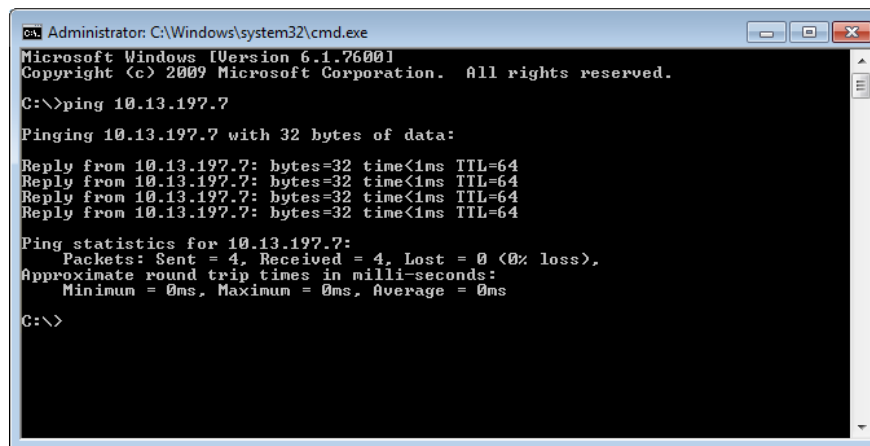


Figure 66. Ping Command

To verify that the update was successful, reconnect using either Telnet or a Web browser.

6. After verifying that the IP address change was successful, enter the `arp -d` command at the DOS prompt. For example:

`arp -d 10.13.197.7` removes 10.13.197.7 from the ARP table or
`arp -d*` removes all static IP addresses from the ARP table.

Connect as a Telnet Client

The Microsoft Telnet utility is available from the command window. Telnet allows you to input SIS commands to the SMX from the PC via the Ethernet link and the LAN.

Access the command window and start Telnet as follows:

1. From the Windows Start menu, navigate to and select **All Programs > Accessories > Command Prompt**. A DOS command window opens.

NOTES: The command prompt can also be accessed from the **Run...** field.

- For Windows 7, click the Windows **Start** menu, and enter `cmd` in the **Search Programs and Files** field. Select **Cmd** from the list.
- For older Windows operating systems, click the Windows **Start** menu and select **Run...** In the Run window, enter `command` in the **Open** field and click **OK**.

3. At the prompt, enter `telnet`. A display similar to **figure 67** opens.

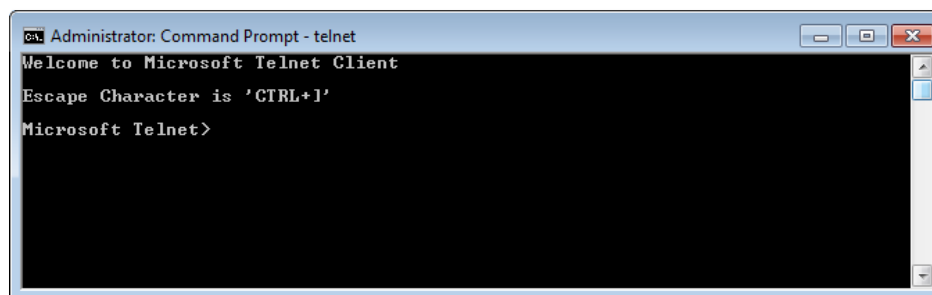


Figure 67. Telnet Screen

Telnet tips

It is not the intention of this guide to detail all of the operations and functionality of Telnet; however, some basic level of understanding is necessary for operating the SMX through Telnet.

Connecting to the SMX (Open command)

Connect to the SMX using the **Open** command. Once your computer is connected to the SMX, you can enter the SIS commands the same as you would if you were using the RS-232 link.

Connect to the SMX as follows:

1. At the Telnet prompt, enter **open <IP address>**.

If the SMX is not password-protected, no further prompts are displayed until you disconnect the PC from the SMX .

If the switcher is password-protected, Telnet displays the password prompt.

2. If necessary, enter the password at the password prompt.

Ethernet connection to the switcher can be password-protected. There are two levels of password-protection: administrator and user.

A person logged on as an administrator has full access to all SMX switching capabilities and editing functions.

A person logged on as a user can select test patterns, mute or unmute the output, select a blue screen, and view all settings with the exception of passwords. By default, the switcher is delivered with both passwords set to carriage return.

Once logged in, the SMX returns either **Login Administrator** or **Login User**. No further prompts are displayed until the computer is disconnected from the SMX .

Escape character and Esc key

When Telnet is first started, the utility advises that the Escape character is **Ctrl+J**. Many SIS commands include the keyboard **<Esc>** key. Consequently, some confusion may exist between the Escape character and the **<Esc>** key.

The Telnet Escape character is a key combination: The **<Ctrl>** key and the **<J>** key pressed simultaneously. Pressing these keys displays the Telnet prompt while leaving the connection to the SMX intact.

The Escape key, used for SIS commands, is the **<Esc>** key on the keyboard.

Local echo

Once the computer is connected to the SMX, by default, Telnet does not display keystrokes on the screen. SIS commands are entered blindly, and only the SIS responses are displayed on the screen. To command Telnet to show all keystrokes, enter **set local_echo** at the Telnet prompt before you open the connection to the switcher.

With local echo turned on, keystrokes and the SMX responses are displayed on the same line. Example: **1*1*1!010ut01 In01 A11** where **1*1*1!** is the SIS command and **010ut01 In01 A11** is the response.

Note that all keystrokes are displayed, even those that should be masked, such as the password entry. For example, when entering a password with local echo turned on, **a*d*m*i*n*** is displayed, where **admin** is the keyed-in password and ********* is the masked response.

Local echo can be turned off by entering **unset local_echo** at the Telnet prompt. If the computer is connected to the SMX, and you need to access the Telnet prompt to turn local echo off, enter the Escape sequence (**<Ctrl> + <J>**).

Setting carriage return line feed

Unless commanded otherwise, Telnet transmits a line feed character only (no carriage return) to the connected switcher when the <Enter> key is pressed. This is the correct setting for SIS communication with the SMX. The Telnet `set crlf` command forces Telnet to transmit carriage return and line feed characters when <Enter> is pressed; however, if `crlf` is set, the SIS link with the switcher does not function properly.

Closing the link to the switcher

To close the link to the SMX, access the Telnet prompt by entering the Escape sequence (<Ctrl> + <]>). At the Telnet prompt, enter `close`.

Help

For Telnet command definitions, enter `?` at the Telnet prompt.

Exiting Telnet (Quit command)

Exit the Telnet utility by entering `quit` at the Telnet prompt. If you are connected to the SMX switcher, access the Telnet prompt by entering the Escape sequence (<Ctrl> + <]>).

Subnetting — A Primer

A subnet is a subset of a network — a set of IP devices that have portions of their IP addresses in common. It is not the purpose of this manual to describe TCP/IP protocol in detail. However, some understanding of TCP/IP subnetting is necessary in order to understand the interaction of the SMX and the mail server gateway. To understand subnetting at the level required to install and operate the SMX, you must understand the concepts of a gateway, local and remote devices, IP addresses and octets, and subnet masks and octets.

Gateways

The SMX can communicate with the e-mail server that it uses for e-mail notification directly (if they are on the same subnet), or the communication can be routed through a gateway (a computer that provides a link between different subnets).

Local and Remote Devices

The local and remote devices are defined from the point of view of the function being described. In this guide, subnetting is an issue when you are using the controlling PC to set TCP/IP and e-mail values in the SMX (see [IP Settings/Options](#) on page 77, [SMX Control Software](#) on page 59, [Email Settings Page](#) on page 94, and [HTML Configuration and Control](#) on page 87). When setting up the variables for e-mail notification, which may include subnetting, the SMX is the local device and the e-mail server is the remote device.

IP Addresses and Octets

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called octets, which are separated by dots (periods) (see [figure 68](#)). Each octet can be numbered from 000 through 255. Leading zeros, up to 3 digits total per octet, are optional. Values of 256 and above are invalid.

Typical IP Address: 192,168,254,254
Octets

Figure 68. IP Address and Octets

Subnet Masks and Octets

The subnet mask (see [figure 69](#)) is used to determine whether the local and remote devices are on the same or different subnet. The subnet mask consists of four numeric octets separated by dots. Each octet can be numbered from 000 through 255, up to 3 digits total per octet. Leading zeros are optional. The octets determine whether or not the same octets of two IP addresses will be compared when determining if two devices are on the same subnet.

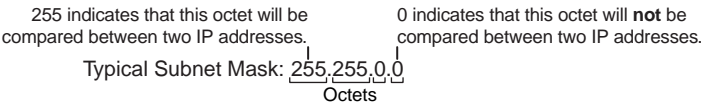


Figure 69. Subnet Mask and Octets

Determining Whether Devices Are on the Same Subnet

To determine the subnet, the local device IP address is compared to the remote device IP address (see [figure 70](#)). The octets of each address are compared or not, depending on the value in the related subnet mask octet.

- If a subnet mask octet contains the value 255, the related octets of the local device address and the remote device IP address are unmasked.
Unmasked octets are compared (indicated by ? in [figure 70](#))
- If the subnet mask octet contains the value 0, the related octets of the local device and remote device IP addresses are masked.

Masked octets are not compared (indicated by X in [figure 70](#)).

If the unmasked octets of the two IP addresses match (indicated by = in figure 70, example 1), the two addresses are on the same subnet.

If the two unmasked fields do not match (indicated by ≠ in figure 70, example 2 and example 3), the addresses are not on the same subnet.

	Example 1	Example 2	Example 3
Local IP Address:	192.168.254.254	192.168.254.254	192.168.254.254
Subnet Mask:	255.255.0.0 (??.X.X)	255.255.0.0 (??.X.X)	255.255.0.0 (??.X.X)
Remote IP Address:	192.168.2.25	190.190.2.25	192.190.2.25
Match?:	=.X.X — Match (Same subnet)	≠.X.X — No match (Different subnet)	≠.X.X — No match (Different subnet)

Figure 70. Comparing the IP Addresses

Reference Information

This section gives specifications for I/O boards, identifies part numbers for related products, and describes mounting procedures and button label customizing. This section includes:

- [Specifications](#)
- [Included Parts](#)
- [Cables](#)
- [Frames and I/O Boards](#)
- [Mounting the Switcher](#)
- [Button Labels](#)
- [Button Label Blanks](#)

Specifications

Video — composite video (SMX 84/88/1616 V)

Routing	
SMX 84 V	8 x 4 matrix
SMX 88 V	8 x 8 matrix
SMX 1616 V	16 x 16 matrix
Gain	Unity
Bandwidth	150 MHz (-3 dB), fully loaded
Differential phase error	1.0° at 3.58 MHz and 4.43 MHz
Differential gain error	1.0% at 3.58 MHz and 4.43 MHz
Crosstalk	-60 dB @ 5 MHz
Switching speed	100 ms (max.)

Video input — composite video (SMX 84/88/1616 V)

Number/signal type	8 or 16 composite video, S/PDIF digital audio (not reclocked)
Connectors	8 or 16 female BNC
Nominal level	1 Vp-p for composite video
Minimum/maximum levels	Analog: 0.1 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Return loss	<-40 dB @ 5 MHz
DC offset (max. allowable)	1.0 V

Video output — composite video (SMX 84/88/1616 V)

Number/signal type	4, 8, or 16 composite video, S/PDIF digital audio (not reclocked)
Connectors	4, 8, or 16 female BNC
Nominal level	1 Vp-p for composite video
Minimum/maximum levels	0.1 V to 2.0 Vp-p (follows input)
Impedance	75 ohms
Return loss	<-40 dB @ 5 MHz
DC offset	±5 mV with input at 0 offset

Sync — composite video (SMX 84/88/1616 V)

Standards..... NTSC 3.58, NTSC 4.43, PAL, SECAM

Video — S-video (SMX 84/88/1616 SV, SMX 84/88/1616 YC)

Routing
 SMX 84 SV/YC..... 8 x 4 matrix
 SMX 88 SV/YC..... 8 x 8 matrix
 SMX 1616 SV/YC..... 16 x 16 matrix
Gain..... Unity
Bandwidth 150 MHz (-3 dB), fully loaded
Differential phase error..... 1.0° at 3.58 MHz and 4.43 MHz
Differential gain error 1.0% at 3.58 MHz and 4.43 MHz
Crosstalk -60 dB @ 5 MHz
Switching speed 100 ms (max.)

Video input — S-video (SMX 84/88/1616 SV, SMX 84/88/1616 YC)

Number/signal type 8 or 16 S-video, composite video
Connectors
 SMX 84/88/1616 SV 8 or 16 female 4-pin mini DIN
 SMX 84/88/1616 YC..... 8 or 16 x 2 female BNC
Nominal level 1 Vp-p for Y S-video
 0.3 Vp-p for C of S-video
Minimum/maximum levels..... Analog: 0.1 V to 2.0 Vp-p with no offset
Impedance 75 ohms
Return loss <-40 dB @ 5 MHz
DC offset (max. allowable) 1.0 V

Video output — S-video (SMX 84/88/1616 SV, SMX 84/88/1616 YC)

Number/signal type 4, 8, or 16 S-video, composite video
Connectors
 SMX 84/88/1616 SV 4, 8, or 16 female 4-pin mini DIN
 SMX 84/88/1616 YC..... 4, 8, or 16 x 2 female BNC
Nominal level 1 Vp-p for Y S-video
 0.3 Vp-p for C of S-video
Minimum/maximum levels..... 0.1 V to 2.0 Vp-p (follows input)
Impedance 75 ohms
Return loss <-40 dB @ 5 MHz
DC offset ±5 mV with input at 0 offset

Sync — S-video (SMX 84/88/1616 SV, SMX 84/88/1616 YC)

Standards..... NTSC 3.58, NTSC 4.43, PAL, SECAM

Video — wideband (SMX 84/88/1616 WB)

Routing
 SMX 84 WB..... 8 x 4 matrix
 SMX 88 WB..... 8 x 8 matrix
 SMX 1616 WB..... 16 x 16 matrix
Gain..... Unity
Bandwidth 400 MHz (-3 dB), fully loaded
Crosstalk
 8x8..... -82 dB @ 1 MHz, -72 dB @ 5 MHz, -68 dB @ 10 MHz, -61 dB @ 30 MHz,
 -53 dB @ 100 MHz
 16x16..... -74 dB @ 1 MHz, -64 dB @ 5 MHz, -56 dB @ 10 MHz, -48 dB @ 30 MHz,
 -38 dB @ 100 MHz
Switching speed 200 ms (max.)

Video input — wideband (SMX 84/88/1616 WB)

Number/signal type	8 or 16 VGA-QXGA RGBHV, RGBS, RGsB, RsGsBs, HDTV, component video, S-video, composite video, S/PDIF digital audio (not reclocked)
Connectors	8 or 16 female BNC
Nominal level	0.7 Vp-p for RGB
Minimum/maximum levels.....	Analog: 0.3 V to 1.5 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 150 kHz
Vertical frequency.....	30 Hz to 150 Hz
Return loss	<-30 dB @ 5 MHz
DC offset (max. allowable)	1.0 V

Video output — wideband (SMX 84/88/1616 WB)

Number/signal type	4, 8, or 16 VGA-QXGA RGBHV, RGBS, RGsB, RsGsBs, HDTV, component video, S-video, composite video, S/PDIF digital audio (not reclocked)
Connectors	4, 8, or 16 female BNC
Nominal level	0.7 Vp-p for RGB
Minimum/maximum levels.....	0.3 V to 1.5 Vp-p (follows input)
Impedance	75 ohms
Return loss	<-30 dB @ 5 MHz
DC offset	±5 mV with input at 0 offset
Switching type	Triple-Action

Sync— SMX 88 SYNC, SMX 88 H+V, SMX 1616 SYNC

Input type	
SMX 88 SYNC, SMX 1616 SYNC	Composite sync (S)
SMX 88 H+V.....	Separate H and V sync
Output type (follows input)	
SMX 88 SYNC, SMX 1616 SYNC	Composite sync (S)
SMX 88 H+V.....	Separate H and V sync
Input level	0.5 V to 5.0 Vp-p, 4.0 Vp-p normal
Output level	AGC to TTL: 4.0 V to 5.0 V p-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohms
Horizontal frequency	15 kHz to 150 kHz
Vertical frequency.....	30 Hz to 150 Hz
Max. propagation delay.....	35 ns
Max. rise/fall time	4 ns
Polarity.....	Positive or negative (follows input)

Video — VGA (SMX 84/88/1616 VGA)

Routing	
SMX 84 VGA	8 x 4 matrix
SMX 88 VGA	8 x 8 matrix
SMX 1616 VGA	16 x 16 matrix
Gain.....	Unity
Bandwidth	350 MHz (-3 dB), fully loaded
Crosstalk	
8x8.....	-82 dB @ 1 MHz, -72 dB @ 5 MHz, -68 dB @ 10 MHz, -61 dB @ 30 MHz, -53 dB @ 100 MHz
16x16.....	-74 dB @ 1 MHz, -64 dB @ 5 MHz, -56 dB @ 10 MHz, -48 dB @ 30 MHz, -38 dB @ 100 MHz
Switching speed	200 ms (max.)

Video input — VGA (SMX 84/88/1616 VGA)

Number/signal type	8 or 16 VGA-QXGA RGBHV, RGBS, RGsB, RsGsBs, HDTV, component video, S-video, composite video
Connectors	8 or 16 female 15-pin HD
Nominal level	0.7 Vp-p for RGB
Minimum/maximum levels.....	Analog: 0.3 V to 1.5 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 150 kHz
Vertical frequency.....	30 Hz to 150 Hz
Return loss	<-36 dB @ 5 MHz
DC offset (max. allowable)	1.0 V

Video output — VGA (SMX 84/88/1616 VGA)

Number/signal type	4, 8, or 16 VGA-QXGA RGBHV, RGBS, RGsB, RsGsBs, HDTV, component video, S-video, composite video
Connectors	4, 8, or 16 female 15-pin HD
Nominal level	0.7 Vp-p for RGB
Minimum/maximum levels.....	0.3 V to 1.5 Vp-p (follows input)
Impedance	75 ohms
Return loss	<-36 dB @ 5 MHz
DC offset	±6 mV with input at 0 offset
Switching type	Triple-Action

Sync — VGA (SMX 84/88/1616 VGA)

Input type	RGBHV, RGBS, RGsB, RsGsBs
Output type	RGBHV, RGBS, RGsB, RsGsBs (follows input)
Input level	0.5 V to 5.0 Vp-p, 4.0 Vp-p normal
Output level	AGC to TTL: 4.0 V to 5.0 V p-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohms
Horizontal frequency	15 kHz to 150 kHz
Vertical frequency.....	30 Hz to 150 Hz
Max. propagation delay.....	40 ns
Max. rise/fall time.....	18 ns
Polarity.....	Positive or negative (follows input)

Digital video — SMX 44/84/88/1616 SDI

Routing	
SMX 44 HD SDI	4 x 4 matrix
SMX 84 HD SDI	8 x 4 matrix
SMX 88 HD SDI	8 x 8 matrix
SMX 1616 HD SDI	16 x 16 matrix
Gain.....	Unity
Maximum data rate.....	2.97 Gbps
Data types.....	8 or 10 bit
Operation standards.....	SMPTE 292M, SMPTE 259M, SMPTE 424M, ITU-RBT.601, ITU-RBT.1120

Digital video input — SMX 44/84/88/1616 SDI

Number/signal type	4, 8, or 16 single-link SDI, HD-SDI; or dual-link HD-SDI
Connectors	4, 8, or 16 female BNC
Nominal level	0.80 Vp-p ± 10%
Impedance	75 ohms
Return loss	<-15 dB @ 1 MHz to 1.5 GHz
Equalization	Automatic

Input cable equalization distance

HD-SDI

Extron SHR, Belden 1694A cable	500' (152 m)
Extron HR, Belden 1505A cable	400' (122 m)

SDI

Extron SHR, Belden 1694A cable	750' (229 m)
Extron HR, Belden 1505A cable	550' (168 m)

NOTE: The transmission distance varies depending on the signal resolution and on the type of cable, graphics card, and display used in the system.

Digital video output — SMX 44/84/88/1616 SDI

Number/signal type	4, 8, or 16 single-link SDI, HD-SDI; or dual-link HD-SDI
Connectors	4, 8, or 16 female BNC
Nominal level	0.80 V _{p-p} ± 10%
Impedance	75 ohms
Return loss	<-15 dB @ 1 MHz to 1.5 GHz
DC offset	±0.5 V with input at 0 offset
Re-clocking	Automatic, or use available bypass mode for nonstandard rates
Jitter.....	<0.2 VI
Rise/fall time (20-80%)	
SDI	700 ps ±100 ps
HD-SDI	250 ps ±100 ps

Video — SMX 44/48/84/88 DVI

NOTE: *Appropriate DVI-D-to-HDMI cables or adapters are required for HDMI signal input/output.

Routing

SMX 44 DVI	4 x 4 matrix
SMX 48 DVI	4 x 8 matrix
SMX 84 DVI	8 x 4 matrix
SMX 88 DVI	8 x 8 matrix

Gain..... Unity

Maximum data rate..... 4.95 Gbps (1.65 Gbps per color)

Maximum pixel clock..... 165 MHz

Resolution range

Up to 1920x1200 @ 48, 50, or 60 Hz; or 1080p @ 60 Hz

Signal type

Single-link DVI digital video signals are supported.

Digital video

RGB digital video (DVI standards), actively buffered (supports all single link DVI standards from 640x480 @ 60 Hz to 1600x1200 @ 60 Hz computer video)

NOTE: These SMX DVI Series boards are not compatible with HDMI 1.3.

Digital audio

Not supported

Consumer Electronics Control (CEC)

Not supported

EDID and DDC

Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered.

HDCP

Not supported

HPD

Supports hot plug detection (HPD) of display as a pass-through signal.

Standards.....

DVI 1.0, HDMI 1.2

Switching speed

200 ns, max.

Video input — SMX 44/48/84/88 DVI

Number/signal type	4 or 8 (depending on model) digital RGB single-link DVI-D (or HDMI*)
Connectors	4 or 8 female DVI-I
Equalization	Automatic
Input cable length	>100' (30 m) at 1920x1200 @ 48, 50, or 60 Hz; or 1080p; 8 bit color

NOTE: The transmission distance varies depending on the signal resolution and on the type of cable, graphics card, and display used in the system.

Video output — SMX 44/48/84/88 DVI

Number/signal type	4 or 8 (depending on model) digital RGB single-link DVI-D (or HDMI*)
Connectors	4 or 8 female DVI-I
Re-clocking	Automatic
Peripheral device power	250 mA per output

Video — SMX 44/48/84/88 DVI PRO

NOTE: *Appropriate DVI-D to HDMI cables or adapters are required for HDMI signal input/output.

Routing	
SMX 44 DVI PRO	4 x 4 matrix
SMX 48 DVI PRO	4 x 8 matrix
SMX 84 DVI PRO	8 x 4 matrix
SMX 88 DVI PRO	8 x 8 matrix
Gain.....	Unity
Resolution range	Up to 1080p (HDTV) or 1920x1200 (the highest resolution of the single link DVI standard) @ 60 Hz
Signal type	Single-link DVI digital video signals are supported.
Digital video	RGB digital video (DVI and HDMI standards) or Y, Cr, Cb digital component video (HDMI), actively buffered (supports all single link DVI and HDMI (if using an optional adapter) standards from 640x480 @ 60 Hz to 1600x1200 @ 60 Hz computer video)

NOTE: These SMX DVI PRO Series boards are compatible with HDMI 1.3.

Digital audio	Supports HDMI audio (if using an HDMI to DVI adapter) transmitted through the RGB and Y, Cr, Cb lines, actively buffered.
Consumer Electronics Control (CEC)	Not supported
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered.
HDCP	Compliant with High-bandwidth Digital Content Protection (HDCP) using DVI and HDMI 1.3 standards
HPD	Supports hot plug detection (HPD) of display as a pass-through signal.
Maximum data rate.....	6.75 Gbps (2.25 Gbps per color)
Maximum pixel clock.....	225 MHz
Standards.....	DVI 1.0, HDMI 1.3
Switching speed	200 ns, max.

Video input — SMX 44/48/84/88 DVI PRO

Number/signal type	4 or 8 (depending on model) digital RGB single link DVI-D (or HDMI*)
Connectors	4 or 8 female DVI-I (digital only)
Equalization	Automatic
Input cable length	>100' (30 m) at 1920x1200 @ 48, 50, or 60 Hz; or 1080p; 8 bit color

NOTE: The transmission distance varies depending on the signal resolution and on the type of cable, graphics card, and display used in the system.

Video output — SMX 44/48/84/88 DVI PRO

Number/signal type	4 or 8 (depending on model) digital RGB single link DVI-D (or HDMI*)
Connectors	4 or 8 female DVI-I (digital only)
Re-clocking	Automatic
Peripheral device power	250 mA per output

Video — SMX 44/48/84/88 HDMI

NOTE: *Appropriate HDMI to DVI-D cables or adapters are required for DVI signal input/output.

Routing	
SMX 44 HDMI	4 x 4 matrix
SMX 48 HDMI	4 x 8 matrix
SMX 84 HDMI	8 x 4 matrix
SMX 88 HDMI	8 x 8 matrix
Gain	Unity
Resolution range	Up to 1920x1200 or 1080p @ 60 Hz
Signal type	Single-link HDMI (or DVI-D*)
Digital video	RGB digital video (DVI and HDMI standards) or Y, Cr, Cb digital component video (HDMI), actively buffered (supports all single-link DVI (if using an optional adapter) and HDMI standards from 640x480 @ 60 Hz to 1600x1200 @ 60 Hz computer video)

NOTE: These SMX HDMI Series boards are compatible with HDMI 1.3.

Digital audio	Supports HDMI audio transmitted through the RGB and Y, Cr, Cb lines, actively buffered.
Consumer Electronics Control (CEC)	Not supported
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered.
HDCP	Compliant with High-bandwidth Digital Content Protection (HDCP) using DVI and HDMI 1.3 standards
HPD	Supports hot plug detection (HPD) of display as a pass-through signal.
Maximum data rate	6.75 Gbps (2.25 Gbps per color)
Maximum pixel clock	225 MHz
Standards	DVI 1.0, HDMI 1.3
Switching speed	200 ns, max.

Video input — SMX 44/48/84/88 HDMI

Number/signal type	4 or 8 (depending on model) digital RGB single-link HDMI (or DVI-D*)
Connectors	4 or 8 female HDMI type A
Equalization	Automatic
Input cable length	>100' (30 m) at 1920x1200 @ 48, 50, or 60 Hz; or 1080p; 8 bit color

NOTE: The transmission distance varies depending on the signal resolution and on the type of cable, graphics card, and display used in the system.

Video output — SMX 44/48/84/88 HDMI

Number/signal type	4 or 8 (depending on model) digital RGB single-link HDMI (or DVI-D*)
Connectors	4 or 8 female HDMI type A
Re-clocking	Automatic
Peripheral device power	250 mA per output

Optical specifications— SMX 88/1616 FOX Fiber Optic I/O board

NOTE: The fiber optic I/O cards are class 1 laser products. They meet the safety regulations of IEC-60825, FDA 21 CFR 1040.10, and FDA 21 CFR 1040.11.

Number/type 8 or 16 singlemode, or 8 or 16 multimode fiber optic inputs and outputs per I/O board

NOTE: Only one fiber is required to transmit video, audio, and unidirectional data. A second fiber is required to transmit return data for bidirectional control/communication.

Connectors 16 or 32 LC connectors per I/O board

Operating distance

Singlemode 30 km (18.75 miles) with singlemode (SM) cables with an Extron singlemode distribution amplifier or Tx/Rx unit

Multimode..... 300 m (985') with 62.5 μ m multimode (MM) cables with an Extron multimode distribution amplifier or Tx/Rx unit
1 km (3280') with 50 μ m multimode (MM) cables with an Extron multimode distribution amplifier or Tx/Rx unit
2 km (6561') with 50 μ m 2000 MHz bandwidth laser multimode cable with an Extron multimode distribution amplifier or Tx/Rx unit

NOTE: Operating distance is approximate. These are typical distances. The maximum distance may be greater than these typical numbers depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.

Nominal peak wavelength 850 nm for multimode (MM), 1310 nm for singlemode (SM)

Transmission power

Singlemode -5 dBm, typical

Multimode..... -5 dBm, typical

Optical loss budget

Singlemode 12 dB, maximum

Multimode..... 7 dB, maximum

Maximum channel data rate..... 4.25 Gbps

Video — SMX 88/1616 FOX

Routing 8 x 8 or 16 x 16 unidirectional (Tx) matrix or
4 x 4 or 8 x 8 bidirectional (Tx/Rx) matrix

Gain Unity

Pixel data bit depth 8 bits per channel, 3 channels (R, G, B)

Video/audio input — SMX 88/1616 FOX

Number/signal type 8 or 16 fiber optic signals

Connectors 8 or 16 LC connectors per I/O board

NOTE: Input comes from an Extron fiber optic transmitter or fiber optic distribution amplifier.

Video/audio output — SMX 88/1616 FOX

Number/signal type 8 or 16 fiber optic signals

Connectors 8 or 16 LC connectors per I/O board

NOTE: Output connects to an Extron fiber optic receiver.

USB — SMX 44/84 USB

USB specification.....	USB 2.0 compatible
USB data rates.....	Low speed (1.5 Mbps), full speed (12 Mbps), high speed (480 Mbps)

USB input — SMX 44/84 USB

Connectors	4 or 8 female USB type B
------------------	--------------------------

USB output — SMX 44/84 USB

Connectors	8 female USB type A
------------------	---------------------

Audio — SMX 84/88/1616A (analog)

Routing	
SMX 84 A.....	8 x 4 stereo matrix
SMX 88 A.....	8 x 8 stereo matrix
SMX 1616 A.....	16 x 16 stereo matrix
Gain.....	Unbalanced output: -6 dB; balanced output 0 dB
Frequency response.....	20 Hz to 20 kHz, ± 0.05 dB
THD + Noise.....	0.03% @ 1 kHz, 0.3% @ 20 kHz at nominal level
S/N.....	>102 dB at maximum output (21 dBu, unweighted) (balanced)
Crosstalk.....	<-95 dB @ 1 kHz, fully loaded
Stereo channel separation	>98 dB @ 1 kHz
CMRR	>70 dB @ 20 Hz to 20 kHz

Audio input — SMX 84/88/1616 A (analog)

Number/signal type	8 or 16 stereo, balanced/unbalanced
Connectors	(8 or 16) 3.5 mm captive screw connector, 5 pole
Impedance	>10k ohms unbalanced/balanced, DC coupled
Nominal level	0 dBu (0.775 Vrms)
Maximum level.....	+19.5 dBu, (balanced or unbalanced) at 1% THD+N
Input gain adjustment	-18 dB to +24 dB, adjustable per input; default = 0 dB

NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV \approx 2 dBu

Audio output— SMX 84/88/1616 A (analog)

Number/signal type	4, 8, or 16 stereo, balanced/unbalanced
Connectors	(8 or 16) 3.5 mm captive screw connector, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	± 0.1 dB channel to channel
Maximum level (Hi-Z).....	>+21 dBu, balanced or unbalanced at 0.1% THD+N
Maximum level (600 ohm).....	>+15 dBm, balanced or unbalanced at 0.1% THD+N
Volume control range.....	-76 dB to 0 dB (volume numbers 0 through 64) in a 35 dB increment from step 0 to step 1, then in 1 dB increments from steps 1 to 64; default = 64 (0 dB)

NOTE: Attenuation = volume number minus 64. The default is 0 dB = volume number 64.

Control/remote — switcher host ports

Serial host control port.....	1 bidirectional RS-232 or RS-422, rear panel female 9-pin D connector 1 bidirectional RS-232 front panel 2.5 mm mini stereo jack
Baud rate and protocol.....	9600 (default), 19200, 38400, 115200 baud (rear port only), adjustable; 8 data bits, 1 stop bit, no parity
Serial control pin configurations	
9-pin female D connector	
RS-232.....	2 = Tx, 3 = Rx, 5 = GND
RS-422.....	2 = Tx-, 3 = Rx-, 5 = GND, 7 = Rx+, 8 = Tx+
Mini stereo jack	
RS-232.....	Tip = Tx, ring = Rx, sleeve = GND
Ethernet control port.....	1 female RJ-45
Ethernet data rate (for network communication)	10/100Base-T, half/full duplex with autodetect
Ethernet protocol	ARP, ICMP (ping), IP, TCP, DHCP, HTTP, SMTP, Telnet
Ethernet default settings	Link speed and duplex level = autodetected IP address = 192.168.254.254 Subnet mask = 255.255.0.0 Default gateway = 0.0.0.0 DHCP = off
Web server.....	Up to 200 simultaneous sessions 7.0 MB nonvolatile user memory
Program control	Extron control/configuration program for Windows® Extron Simple Instruction Set™ (SIS™) Microsoft® Internet Explorer® ver. 6 or higher, Telnet

General

Power supply.....	Internal, with or without redundant power supply Input: 100-240 VAC, 50-60 Hz
Power consumption	15.0 to 180 watts, depending on configuration
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling.....	Fan, left to right (as viewed from front panel)
Thermal dissipation, full load	50 to 620 BTU/hr, depending on configuration
Mounting	
Rack mount.....	Yes
Enclosure type.....	Metal
Enclosure dimensions	(Depth excludes connectors. Width excludes rack ears.)
SMX 200 Frame.....	3.5" H x 17.0" W x 12.0" D (2U high, full rack wide) (8.9 cm H x 43.1 cm W x 30.5 cm D)
SMX 300 Frame.....	5.25" H x 17.0" W x 12" D (3U high, full rack wide) (13.3 cm H x 43.2 cm W x 30.5 cm D)
SMX 400 Frame.....	7.0" H x 17.0" W x 12" D (4U high, full rack wide) (17.8 cm H x 43.2 cm W x 30.5 cm D)
SMX 500 Frame.....	8.75" H x 17.0" W x 12" D (5U high, full rack wide) (22.2 cm H x 43.2 cm W x 30.5 cm D)

Product weight with boards installed

SMX 200 Frame.....	16.2 lbs (7.3 kg)
SMX 300 Frame.....	18.1 lbs (8.2 kg)
SMX 400 Frame.....	20.3 lbs (9.2 kg)
SMX 500 Frame.....	23.9 lbs (10.8 kg)

Shipping weight with boards installed

SMX 200 Frame.....	20 lbs (10 kg)
SMX 300 Frame.....	22 lbs (10 kg)
SMX 400 Frame.....	26 lbs (12 kg)
SMX 500 Frame.....	30 lbs (14 kg)

Shipping weight of individual boards, if purchased separately

SMX 88 FOX.....	2 lbs (1 kg)
SMX 1616 FOX.....	3 lbs (2 kg)

DIM weight

SMX 400 Frame.....	30 lbs (14 kg)
--------------------	----------------

Vibration..... ISTA 1A in carton (International Safe Transit Association)

Regulatory compliance

Safety	CE, c-UL, UL
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI

MTBF..... 30,000 hours

Warranty..... 3 years parts and labor

NOTE: All nominal levels are at $\pm 10\%$.

NOTE: Specifications are subject to change without notice.

Included Parts

Included Part	Part Number
SMX MultiMatrix Switcher	60-xxx-01
US style IEC power cord	
Rubber feet, self-adhesive	
SMX System MultiMatrix Switcher Setup Guide	
Tweezer (small screwdriver)	
Windows-based control software on CD-ROM	

NOTE: To customize the SMX unit, use the SMX Configurator, available at www.extron.com, or contact Extron Customer Support (see [rear outer cover](#) for contact numbers).

Included LockIt™ Packages for SMX HDMI Boards	Part Number
SMX 44 HDMI (8 LockIts)	64-001-08
SMX 48 HDMI (12 LockIts)	64-001-12
SMX 84 HDMI (12 LockIts)	64-001-12
SMX 88 HDMI (16 LockIts)	64-001-16

NOTE: The SMX HDMI boards and custom SMX with SMX HDMI boards come with a set of one LockIt and one black zip tie for each HDMI connector or HDMI connector stack.

Cables

NOTE: For signal cable requirements, please check the latest Extron Catalog or visit www.extron.com for a comprehensive list. The cable listed below is for front panel RS-232 or RS-422 use.

Accessory	Part Number
9-pin D female to 2.5 mm TRS configuration cable	70-335-01

Frames and I/O Boards

Frames (with front panel control [FPC]) and optional I/O boards can be ordered separately.

Frame	Part Number
SMX 200 Frame with FPC	60-1021-01
SMX 300 Frame with FPC	60-855-01
SMX 400 Frame with FPC	60-856-01
SMX 500 Frame with FPC	60-857-01
SMX 200 Frame with FPC and redundant power supply	60-1021-11
SMX 300 Frame with FPC and redundant power supply	60-855-11
SMX 400 Frame with FPC and redundant power supply	60-856-11
SMX 500 Frame with FPC and redundant power supply	60-857-11

I/O Board	Part Number	I/O Board	Part Number
Blank panels		SDI/HD-SDI boards	
SMX single space	70-633-01	SMX 44 HD-SDI	70-597-01
SMX single space	70-633-02	SMX 84 HD-SDI	70-597-02
Low resolution video boards		SMX 88 HD-SDI	70-597-03
SMX 83 V	70-591-02	SMX 1616 HD-SDI	70-597-04
SMX 88 V	70-591-03	DVI boards	
SMX 1616 V	70-591-04	SMX 44 DVI	70-598-01
S-video - DIN boards		SMX 48 DVI	70-598-05
SMX 84 SV	70-592-02	SMX 84 DVI	70-598-02
SMX 88 SV	70-592-03	SMX 88 DVI	70-598-03
SMX 1616 SV	70-592-04	DVI Pro boards	
S-video - BNC boards		SMX 44 DVI Pro	70-598-11
SMX 84 YC	70-593-02	SMX 48 DVI Pro	70-598-15
SMX 88 YC	70-593-03	SMX 84 DVI Pro	70-598-12
SMX 1616 YC	70-593-04	SMX 88 DVI Pro	70-598-13
Wideband video boards		Fiber optic (Singlemode) boards	
SMX 84 WB	70-594-02	SMX 88 FOX 4G SM	70-635-03
SMX 88 WB	70-594-03	SMX 1616 FOX 4G SM	70-635-04
SMX 1616 WB	70-594-04	Fiber optic (multimode) boards	
Sync boards		SMX 88 FOX 4G MM	70-634-03
SMX 88 Sync (H or V)	70-595-03	SXM 1616 FOX 4G MM	70-634-04
SMX 88 H+V Sync	70-595-05	HDMI boards	
SMX 1616 Sync (H or V)	70-595-04	SMX 44 HDMI	70-773-01
VGA boards		SMX 48 HDMI	70-773-05
SMX 84 VGA	70-596-02	SMX 84 HDMI	70-773-02
SMX 88 VGA	70-596-03	SMX 88 HDMI	70-773-03
SMX 1616 VGA	70-596-04	USB boards	
Analog Audio boards		SMX 44 USB	70-672-01
SMX 84 A	70-599-02	SMX 84 USB	70-672-02
SMX 88 A	70-599-03		
SMX 1616 A	70-599-04		

Mounting the Switcher

NOTE: The SMX comes in 2U, 3U, 4U, or 5U sizes. Before attempting installation, ensure the rack is able to accommodate your particular device size.

Four uninstalled rubber feet are included with the SMX. Install the feet only if the unit is to be mounted on a table top (see [Tabletop Placement](#)).

Tabletop Placement

For tabletop placement, install the (provided) self-adhesive rubber feet/pads onto the four corners of the bottom of the device.

UL Guidelines for Rack Mounted Devices

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the SMX device in a rack.

- 1. Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the SMX in an environment compatible with the maximum ambient temperature ($T_{ma} = + 122\text{ }^{\circ}\text{F}$, $+ 50\text{ }^{\circ}\text{C}$) specified by Extron.
- 2. Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.
- 3. Mechanical loading** — Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.
- 4. Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- 5. Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Rack Mounting

To rack mount the SMX, use two screws on each end of the switcher to attach it to the rack (see [figure 71](#)).

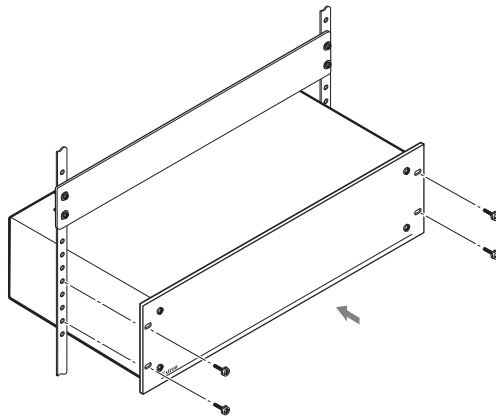


Figure 71. Mounting the SMX

Button Labels

Page 130 provides strips of blank button labels. If desired, photocopy them or cut them out of the guide, write button information in each button area as desired, and put them in the SMX input or output buttons windows. Labels can be created using the Extron Button-Label Generator software.

Using the Button Label Generator

The Button Label Generator software creates labels that you can place inside the translucent covers of the input and output push buttons (see **Replacing Button Labels** on page 128 for procedures for removing the replacing the translucent covers). You can create labels with names, alphanumeric characters, icons, and even colored bitmaps for easy and intuitive input and output selection.

The program is contained on the same DVD as the SMX Control Program and is installed automatically when you install the control software.

By default, the software files are placed in the C:\Program Files\Extron\ButtonLabelGenerator directory. The **Button Label Generator** icon is placed in the "Extron Electronics" group or folder.

1. To run the Button Label Generator program, double-click on the **Button Label Generator** icon (shown at right) in the Extron Electronics group or folder. The Button Label Generator window appears (see **figure 72**).

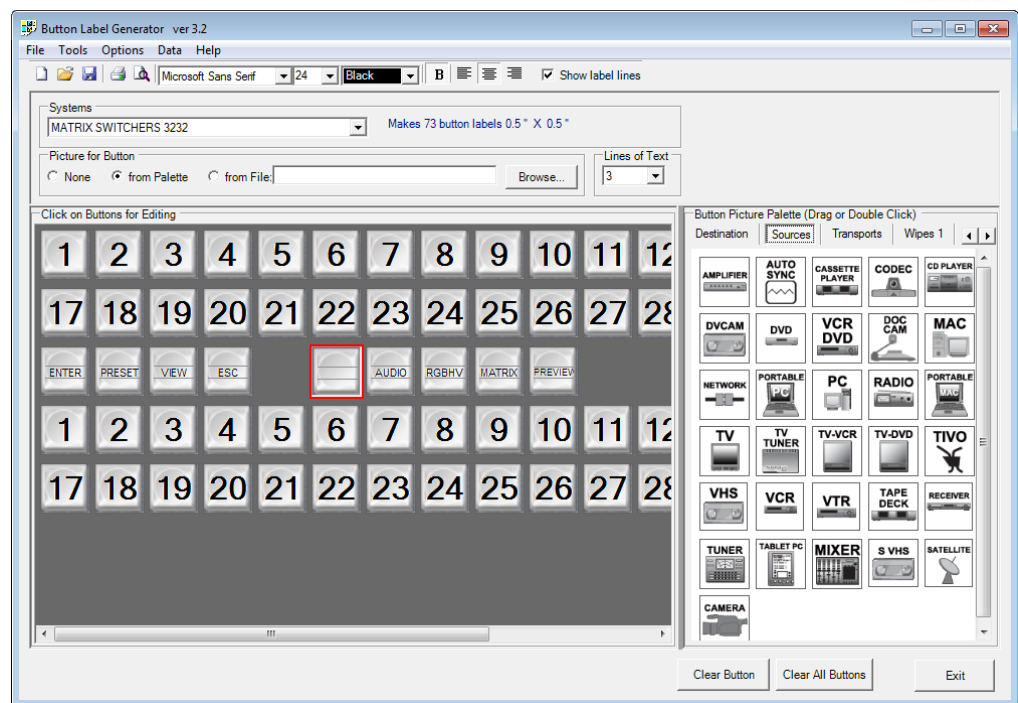
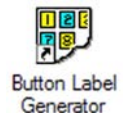


Figure 72. Button Label Generator Window

2. From the **Systems** drop-down list, select a system button configuration.

The **Matrix Switchers 3232** or **1616** selections most closely match the button configuration of the SMX (the SMX option gives you four rows of blank buttons). However, you can select any option from this menu. Selecting **Customize Button Layouts** opens a blank worksheet on which customized buttons can be placed in any desired configuration.

3. Click on the button representation that you want to edit. A red box surrounds the selected button.

4. Edit the selected button by using any of the tools provided on the Button Label Generator window. Some of the edits you can make are:
 - Enter text and select the font, text size, and text color from the drop-down lists on the menu bar.
 - Select an icon from the Button Picture Palate and drag it to a button.
 - Place a bitmap image from your computer on a selected button.

To remove all the text or the image from a button, click **Clear Button**. To remove the text and images from all the buttons, click **Clear All Buttons**.

To access the Help program, select **Use Help** from the **Help** menu.

5. After creating the labels, print them out by selecting **Print** from the **File** menu in the upper-left corner of the Button Label Generator window.

To save the button label set as an .xml file on your computer, select **Save As** from the **File** menu and give the label a file name.

Replacing Button Labels

The button caps are pre-labeled for your convenience. However, you can change them with the included button labels.

The button assembly consists of a clear lens cap, the button label, and a white diffuser (see [figure 73](#)). Remove the button assembly from the SMX as follows:

1. Make new labels using either the blanks on [page 130](#) or the Button Label Generator software. Cut the labels out.
2. Remove the button assembly by inserting a small, flat head screwdriver, between the button base and the diffuser to gently pry the button assembly off the button plunger, as shown in the drawing at right.
3. Locate the small corner notch on the lens cap, and slide the screwdriver between the lens cap and the diffuser (see [1](#) in [figure 73](#)).
4. Rotate the screwdriver and carefully pry the two pieces apart (see [2](#) in the [figure 73](#)).

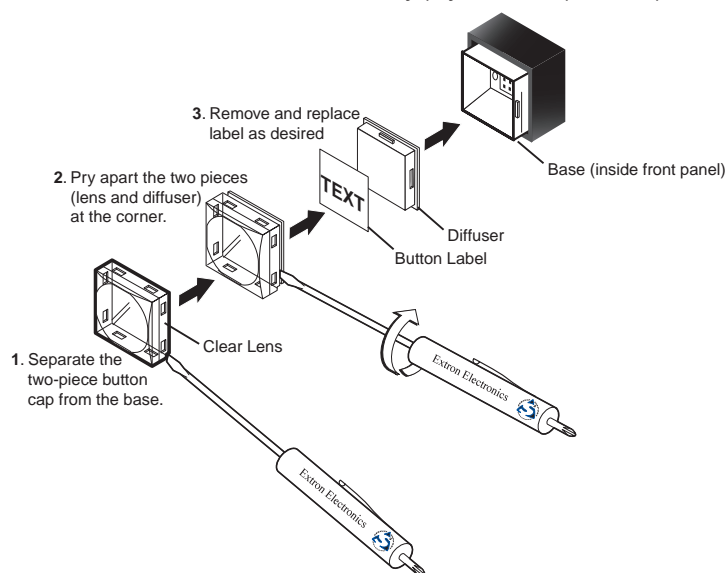
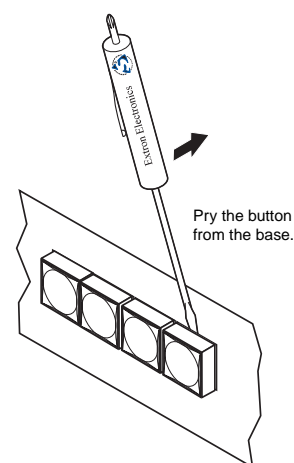


Figure 73. Replacing a Button Label

5. Lift out the transparent square label that you want to replace. You may need to use the small screwdriver to gently pry the label out.
6. Insert one of the new labels you created in step 1 into the clear button cap, align the white backing plate with the cap, and firmly snap it into place.
7. Gently, but firmly, press the reassembled button into place on the SMX front panel.
8. Repeat steps 1 through 7 as needed to relabel other buttons.

Button Label Blanks

[illegible]

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America,
and Central America:**

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan:

Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

**Europe, Africa, and the Middle
East:**

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:

Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:

Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: (714) 491-1500
Asia: 65.6383.4400

Europe: 31.33.453.4040
Japan: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron Headquarters +1.800.633.9876 (Inside USA/Canada Only) Extron USA - West +1.714.491.1500 +1.714.491.1517 FAX	Extron Europe +800.3987.6673 (Inside Europe Only) Extron USA - East +1.919.863.1794 +1.919.863.1797 FAX	Extron Asia +800.7339.8766 (Inside Asia Only) +31.33.453.4040 +65.6383.4400 +65.6383.4664 FAX	Extron Japan +81.3.3511.7655 +81.3.3511.7656 FAX	Extron China +4000.398766 Inside China Only +86.21.3760.1568 +86.21.3760.1566 FAX	Extron Middle East +971.4.2991800 +971.4.2991880 FAX	Extron Korea +82.2.3444.1571 +82.2.3444.1575 FAX	Extron India 1800.3070.3777 Inside India Only +91-80-3055.3777 +91 80 3055 3737 FAX
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